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ADDRESSES.

AN ADDRESS

To the Graduating Class of the College of Physicians and Surgeons of Keokuk, Iowa, at the Opera House, March 5, 1895.

BY HON. W. W. DODGE,

OF THE BURLINGTON, IOWA, BAR.

On an occasion such as this, are we not forcibly reminded of those beautiful words of Longfellow, in his "Psalm of Life:"

"Lives of great men all remind us
We can make our lives sublime,
And, departing, leave behind us
Footprints on the sands of time;

"Footprints that perhaps another
Sailing o'er life's solemn main,
A forlorn and shipwrecked brother
Seeing shall take heart again."

This evening with pleasurable interest we have witnessed the President of the College of Physicians and Surgeons present to the graduates of the class of 1895, their diplomas. One can scarcely appreciate the heart throbbings of a graduate who receives this "letter of recommendation," this "honor," this "distinction" from the faculty of the college that has been the scene of his hours, days and years of study and now like a fond parent witnesses the coronation of his successful labor. The graduate who worthily receives a diploma, which as its very meaning signifies, "is a letter of recommendation," should esteem the event as one of the proudest and happiest of his life.

To the graduate, the young doctor, may I suggest that you guard with jealous care this precious parchment. Frame it, hang it on your office wall, there to remain as a pleasant reminder of the labor and toil of your school days. Treasure it as an incentive to industry, ambition, and the use of your God given talents, so that in the autumn of your days, after you have witnessed the "leaves fall over the roots of the tree of life," your fellow graduates may not only proudly point to you as a credit to your alma mater, but the rising generation may find so much that is noble, sublime and grand in your "Footprints on the sands of time," as to emulate you as an exemplar.

When I received an invitation a short time since from the faculty of this college to address you this evening, I felt that I had been particularly honored, especially as I am not a member of the medical fraternity, but only an humble disciple of Blackstone. Therefore in the course of my remarks, confined to the time limit of thirty minutes, if I should inadvertently use the words "injunction," "mandamus," *et al*, referring to the medical method of the prevention of disease, instead of prophylactic or some pharmacopœia or materia medica term, I crave you give me the benefit of all "reasonable doubt" as to the honesty of my purpose.

From recent statistics I learn that there are in the United States about 725 medical colleges now in operation, and that there are about 105,183 practicing physicians. In the State of Iowa it is said that we have some 3,618 physicians in active practice. There are seven medical colleges in Iowa; the oldest of these, if I am not in error, is the College of Physicians and Surgeons of Keokuk, and to-night we celebrate the fifty-fourth commencement exercises of this famous institution. It is the source of much gratification and pride, not only to the faculty of this college, but to the city of Keokuk, that the number in the class for this past year is 225, being an increase of nearly 100 per cent., and it is the largest class that has been here for twelve years. The past year shows an attendance of ladies twenty-one in number, two of whom have the honor of graduating in the class of 1895. The alumni of this college now numbers nearly three thousand. The high character of the members of the faculty of this college for learning and ability; the splendid and comprehensive course of study; a thorough equipment in all the essentials of its various departments; the past and present reputation for being one of the foremost and best colleges in the country, is what has given a name to the College of Physicians and Surgeons of this city to attract to it the magnificent attendance of this year, and to warrant a large increase in the years to come.

When one searches the labyrinths of the past for the fountain source of the science of the "healing art," he is led into the realms of tradition, the temples of the gods, and the wonderland of heathen mythology. The more one searches for the morning light, on the early struggles of this mystic art, the more he becomes impressed with the grandeur, the beauty, the beneficent purposes of the blessed science of medicine.

Away back in the dark ages of ignorance and superstition, it seems that the power of God lighted but few of the intellects of those days, and even those favored ones of Him who could heal those that touched but the hem of His garment were regarded by many as sorcerers, or possessed of the evil spirit.

To appreciate the curative methods of the modern physician, it is but for us to consider the means adopted by the ancient doctors of medicine in their mode of treatment of the afflicted. The priests who were the medicine men in those days, would establish themselves near thermal springs, or fountains, and among groves. Here would come the afflicted from every quarter seeking health. These places were nothing more or less than ancient health resorts, without the brass band and Wednesday evening ball of the present day health resorts. The healers of the sick would prescribe bleeding, purgatives, friction, and mineral waters. In many instances there would be recovery and benefit to health by reason of temperate habits, pure air and bathing. It seems that avarice with the ancient physician, as well as the modern,

I am sorry to say, played an important part. If the complaint was obstinate in yielding to the ordinary methods of treatment the fees would not only be increased, but the patient would be taken into a temple, there to be deluded into the belief that he must be purified by prayer, sacrifice and offering to the gods, before relief would come. The imagination of the patient played an important part, and if the ordinary treatment was slow in producing healthful results the priests would resort to the use of snakes and non-poisonous serpents that had been tamed for the occasion, and these horrible creatures were made to play an important part in the healing art, by causing dreams and impressions upon the minds of the deluded and ignorant patients.

As we turn the searchlight of investigation into the perspective of the remote ages of antiquity, seeking for truth and knowledge as to the early beginning of the science of medicine, we find helpful authority in the Bible, as also in heathen mythology. Do we not recall the words of Job, spoken to his tormentors: "Ye are forgers of lies; ye are all physicians of no value." And there is Jeremiah the prophet, lamenting over the condition of his people, and exclaiming: "Is there no balm in Gilead; is there no physician there? why, then, is not the health of the daughter of my people recovered?" We read in the Scriptures that Joseph commanded his servants and physicians to embalm him, this being about 1700 years B. C. Thus it is shown that the Egyptians possessed men who practiced the healing art and embalmed the dead, both of which must have required a crude idea of general anatomy.

It is to Greece, the land of art, that much of the ancient history of medicine can be traced, just as she furnishes every other art with the same historical advantages. Of the early physicans, Æsculapius is the most famous. By some he was considered the son of Apollo. A number of the cities of Greece contended for the honor of his birthplace as they did for that of Homer. Æsculapius, owing to his learning and wide knowledge of the science of medicine was given the title of the "God of Medicine." And there was Hippocrates, a great physician and philosopher, who was born in the year 460 B. C., and it is said lived a century. Because of his great learning and his wonderful discoveries in the field of medicine, and the fact that it is said that surgery was first practiced by him, he has been crowned the "Father of Medicine."

Galen was the most eminent physician during the second century, and the people had such great faith in his teachings that they were as a guiding star to the healers of the sick for a thousand years following. The creeds of Hippocrates and Galen were accepted by the medical profession down to the time of that bold "Prince of Empirics," Paracelsus, born in Switzerland in the year 1493. He was highly educated and made a Professor of the School of Medicine at Basel, and while occupying this place, with great solemnity burned the books of Galen, declaring at that time that he had discovered the "elixir vitæ," by which life might be prolonged indefinitely. He was nothing more or less than a charlatan, practiced the vilest arts, and being dissipated in his habits died at the age of 48 years.

Of more modern physicians, William Harvey will be recalled as the one, who, in 1616, demonstrated the circulation of the blood. There is John Hunter, the famous anatomist; Edward Jenner, an English physician who made himself celebrated by the discovery of vaccination as a preventive for that dreadful disease, smallpox. This discovery was made by Jenner in 1776 while in the Alps watching the maids milking the cows. On the cows' udders were sores, likewise on the hands of the maids, and while the smallpox was raging in the neighborhood, the milkmaids were free of the disease. Jenner reasoned that the women had been inoculated with the "cowpox" which proved a prevention to the more terrible disease, smallpox. Pasteur, the great French scientist, gave to the world in recent years a preventive and cure for hydrophobia. Koch, the renowned German physician, discovered a "lymph" or tuberculin for the cure of tuberculosis. Americans point with pride to Dr. Samuel D. Gross, the "Nestor of American surgery." There is Dr. Behring, a German physician and student of Dr. Koch, who is credited with giving suffering humanity the "serum" or "antitoxin," as a prevention and cure for diphtheria. This discovery occurred but a few months since. Thus I could continue to name the illustrious descendants of Æsculapius who adorn the pages of ancient and modern medical history.

If, when Paracelsus proclaimed to the world his discovery of the "elixir vitæ," he had not in fact given to mankind a nostrous humbug, but a blessed boon, for indefinite continuity of good health and life, we should have but little use for the physician of to-day. It seems that the Almighty, in His inscrutable wisdom did not intend to confer upon a human being a power, divine in its character and effect. While such a blessing as an "elixir of life" has not come to us through human instrumentalities, let us not rail against the Divine will. While we consider the wonderful advancement in the sciences of medicine and surgery, the thousand and one discoveries for the amelioration of suffering humanity, it is as little as we can do to offer a thankful prayer to the Giver of All, for these rich blessings to mankind.

How true are the words of that Latin maxim: "*Mens sana in corpore sano*," "a sound mind in a sound body." While the stability and maintenance of government depends upon the intelligence and virtue of its people, it must not be forgotten that the health, strength and physical development of the coming generations must be as jealously guarded. In the early days the Romans were so ambitious to have only the finest specimens of manhood that the strictest laws were enacted relative to marriage; the weak and ill-formed were absolutely prohibited from entering into the marriage state, and only those possessing perfect health and strength were allowed to become the fathers and mothers of the warriors, statesmen and philosophers of those times.

In our day, while no such marital restrictions surround the people, all nations are taking advanced steps in the direction of prevention of disease, as far as possible. This is exemplified in the laws of quarantine at our seaports, the establishment of State boards of health, city sanitation, the power given to the health officer and local authorities to destroy buildings, fill up ponds or do such other acts as may be necessary to stamp out the hotbed of disease, and thus prevent the spread of a pestilence. It is by such heroic means that an epidemic, which if unchecked, would carry death and destruction throughout the land, is

prevented. It is to the intelligent physician, aided by the enforcement of sanitary laws, that the community is largely indebted for its good or poor health. It is to the physician that we must look in municipal bodies, to point out the sore spots that breed disease. Imperfect drainage, impure water, poor ventilation, densely populated tenement houses where squalor, dirt and filth exist, are as dangerous to the health and life of the people as a dog with the hydrophobia upon the streets of a city. Is it not true that physicians are the keepers of the public health and that by reason of their medical knowledge, their intelligence, and the knowledge that it is their duty to prevent, as well as to cure disease they can enthuse the people, give a cry of warning, erect bulwarks of defense, and determine the best methods to prevent an invasion of a dread disease? All honor, I say, to the educated, intelligent physician!

To speak of the "family doctor" is, as it were, to allude to a member of the family circle. He is near and dear to every one in the household. When dread disease or accident has suddenly stricken down a loved one, how anxiously we await his welcome footsteps, how, with trustful hearts, we listen to his cheering words, how he inspires us with the hope of a speedy recovery, how uncomplainingly do we follow his advice, and with hopeful smile we take the most detestable medicine he prescribes. His position in the family circle is one of sacred confidence. The secrets of a home are often imparted to him, while the happiness, love, and the all between man and wife are exposed to his honor or his treachery. He comes to the bedside of the suffering mother, when in her hour of untold agony and indescribable torture—when two lives are trembling in the hand of fate—to help with tender care in bringing into this bright and beautiful world of love, sunshine and happiness, a new life to gladden the home. It is from the cradle to the grave, at beck and call, the family physician comes to us in sunshine or storm, in daylight or darkness, like a ministering angel to soothe, comfort and cure. Do I not utter the sincerest of benedictions which come from the heart of mankind when I say, "God bless the dear, kind-hearted doctor?"

Members of the graduating class, I fully appreciate that I can add but little to the wholesome advice and timely suggestions of your instructors during your collegiate course of study; however, I beg the indulgence of a word. Remember, that the world owes no man a living, and that he who eats of the bread of idleness can not hope to succeed. That professional advancement and aggrandizement depends on individual effort. If you desire to reach the goal of fame and riches, remember that ambition, honor, and the use of your God-given powers will do more to aid you, than to pray to Hercules to strangle the serpent of competition. If you do not prosper, do not blame the rest of mankind. The Philosopher Hobbes, of Malmesbury, once said that, "the natural state of man is war." Your professional education has equipped you for the battle of life; from this night on it will be your duty to fight. Whether you will rise above the well-filled ranks of mediocrity depends on your own self, your willingness to continue the irksome search after knowledge, a persistent determination to surmount all obstacles, to keep your eyes toward the summit of professional eminence, where inscribed in living light are the immortal names of the illustrious members of your profession. May heaven's choicest blessings be in store for you; may you live to enjoy a long, useful and happy life; may the hand of Fate bestow on you fame, wealth and happiness, and in the yielding stone of time may your fondest dream be carved.

LECTURES.

LECTURES ON INTRACRANIAL SURGERY.

II—CEREBRAL HEMORRHAGE AND ITS SURGICAL TREATMENT.

BY EMORY LANPHEAR, M.D., PH.D.
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By the expression "cerebral hemorrhage," is meant bleeding in the substance of the brain or into the cavity of the ventricles. Until very recently such cases have been regarded as beyond the pale of surgical interference. Indeed, only a few years ago Jacobson declared he could find but ten cases recorded as having beeen operated upon, and even Horsley—one of the boldest of cerebral operators—as late as July, 1890, advised tying the common carotid in every case of bad cerebral hemorrhage seen within four hours after the attack. But recently quite a number of operations have been reported with improvement in most cases, and surgeons are beginning to realize the brilliant possibilities of certain classes of hemorrhages, viz., cortical or surface hemorrhages, subcortical and ingravescent or progressive apoplexy.

Most authorities have, until lately, advised against operation for the reason (as expressed by Starr, of New York) that "when a hemorrhage has occurred within the cerebral hemisphere, lacerating the tracts and destroying the tissue, operative interference is out of the question, for tissue once destroyed in the brain is not repaired by Nature, and even if repair were possible the surgeon could not reach and remove the clot without further laceration of very important cerebral structures or serious cerebral hemorrhage." Experience has shown, however, that if the clot be removed early and be not too large, serious permanent injury may sometimes be averted; furthermore the brain may be freely incised in certain directions without marked harm, especially if over a clot which has already destroyed the communicating fibers; and the competent surgeon can usually control any bleeding he may cause in the brain or elsewhere.

Unfortunately it is not always an easy matter to make a differential diagnosis between a hemorrhage which may be safely reached by the surgeon's knife and one which is of basal or nuclear origin; nay, more—it is often a matter of some difficulty to find the bleeding point or even the blood clot after trephining. As a consequence the operator sometimes is compelled to adopt the advice of Krönlein:[1] "In cases where the surgeon is reasonably certain that the symptoms of compression are due to hemorrhage, exploratory trephining is to be continued until the hematoma is found." If not located and removed, at least relief from pressure is afforded by cutting a large opening in the skull, provided the bleeding has already ceased.

In the "ingravescent form"—that in which the symptoms are slight at the outset but gradually become more intensified—trephining should be done

before the blood reaches the ventricles; bleeding into the lateral ventricle may proceed from rupture of a vessel of the choroid plexus or the velum interpositum, but only in rare instances as the usual source is some artery in the brain substance, the blood simply breaking into the ventricles after a considerable clot has formed; so it is rarely necessary to open them, if operation be done early.

According to Edes, the most common form of intracranial hemorrhage has its seat in the white substance of the brain which is consequently more or less lacerated; such a clot may vary in size from a mere point to many ounces, filling a cavity nearly as large as the hemisphere. The vessel which most frequently bleeds is that which is given off from the middle cerebral and runs along the outer side of the nucleus lenticularis where it is covered by the external capsule, hence the large number of clots found in the white substance of the internal capsule. Therefore when the hemorrhage is not found as a meningeal or subcortical lesion as anticipated, this is the point to be sought if the symptoms indicate the middle fossa; if the clot be located outside the internal capsule it may be removed with comparative safety through a large opening in the skull —three or four inches by one and a half or two.

Hemorrhages in the thalamus opticus usually originate in the posterior communicating artery or the posterior cerebral and are too deep to be reached.

DIAGNOSIS.

No attempt at surgical diagnosis should be made while the patient is in deep coma. After the severer apoplectiform symptoms have disappeared, embolism must be carefully excluded as trephining would be wholly inexcusable in the latter disease. The points of differential diagnosis can be found in all good text-books on neurology; they are foreign to our theme and are therefore not considered. It is well also, in determining the character of the disease to exclude hemiplegic forms of intracranial syphilis, and tumors which may be suddenly manifested; though since gummata, if accessible, should be removed as should curable forms of tumor, the differential diagnosis is not so important. The following rules will be found useful in deciding whether or not operation is justifiable when the diagnosis of cerebral hemorrhage is clearly established:

1. When there has been a blow upon the head, and hemiplegia, aphasia or hemianopsia follows, there is nearly always a hemorrhage which may be cured by opening the cranium at the point indicated by cerebral localization.

2. A slight premonitory attack, affecting speech temporarily or producing a heaviness of the hand or foot (or both) for a few minutes, if followed by hemiplegia may be taken as a good point in favor of operation, as the bleeding vessel is probably on the surface or very superficial.

3. When the case presents a history of moderate loss of power or even complete hemiplegia without loss of consciousness, followed in a few hours by the sudden appearance of coma, a marked fall of temperature succeeded by some fever—a hemorrhage has broken into the ventricles or just beneath the meninges, is still progressing and indicates immediate trephining; a day or two afterward will be too late—so if done at all it should be performed within a few hours, if possible.

4. Bilateral hemianopsia (blindness of corresponding sides of both eyes) appearing suddenly is apt to be due to a hemorrhage in the occipital lobe of the opposite side, sufficiently large to be easily found, and justifies exploratory operation.

5. Vomiting, severe occipital headache and vertigo, with or without distinct paralysis, with ocular symptoms of nystagmus or strabismus, appearing suddenly, render a diagnosis of cerebellar hemorrhage probable and indicate exploratory trephining.

6. Paralysis of the third, fourth or sixth pairs of nerves indicates a lesion of the pons and contra-indicates operation.

7. Paralyses of very limited extent, especially if complete, are not often due to hemorrhage, being local palsies rather than the peripheral symptoms indicative of cerebral disease.

8. A very severe headache, followed by gradual but persistently deepening coma, with hemiplegia becoming more and more nearly complete, means a hemorrhage into the great basal ganglia—beyond surgical help.

9. Very sudden and complete hemiplegia and coma (coming on as if the patient were struck with a hammer) contra-indicate operation, particularly if the patient be under 50 years of age; the disease is probably embolism; heart lesions, endoarteritis, a septic process and syphilis strengthen the probability.

10. Profound coma and relaxation without hemiplegia usually depends upon injury of the pons and decide against operation.

11. According to Hughlings Jackson, convulsions, early rigidity and conjugate deviation of the eyes of a spastic form are conclusive evidences of superficial hemorrhage. But convulsions always accompany cerebral hemorrhage in young persons, regardless of location.

12. As an assistance in locating the clot, Durand-Fardel's figures may be quoted. Of 177 cases the hemorrhages were: in the ventricles sixty-six times; in the meninges thirty-one; in the corpus striatum and thalamus opticus twenty-two; in the white substance of the middle lobe eighteen; in the corpus striatum alone thirteen; in the corpus striatum and hemisphere twelve; in the anterior lobes eleven; in the posterior lobes eleven. From which we see that a considerable proportion may be regarded as within the reach of the surgeon.

OPERATION.

The surgical treatment of cerebral hemorrhage consists of: 1, ligature of the ruptured vessel; 2, pressure-stoppage of the bleeding if tying is impossible; or 3, arrest of the carotid stream by ligature—all for checking further bleeding; and removal of a mischief-producing clot after cessation of the hemorrhage, for many distressing symptoms may frequently be relieved by the operation.

Of the first: the probable location of the lesion having been decided, the head is shaved and cleaned by thorough scrubbing and washing with sulphuric ether or alcohol, and sublimate solution 1 to 1000, and a large flap of skin and pericranium laid back. A trephine is applied and the "button" removed, when the opening is enlarged to the size of two by three inches over the area involved. The dura is then incised and turned back and search made for superficial bleeding; if found, the clots are cleaned out and the vessel tied if still active, a small thread of catgut being passed around it by a curved needle and gently tied—it not being best to use much force lest

the fragile artery be cut in two. If not found upon exposing the brain an incision is made near the middle of the particular center indicated; this cut must be vertical to the ganglia, *i.e.*, parallel to the fibers of the corona radiata. The knife must be put more than an inch into the brain at the first stroke and the cut ought not to be more than an inch and a half long. The margins of this incision are gently pulled apart (with broad dissecting forceps or two flat blades) and the white substance inspected for the clot. When the clot is not found in the meninges or as a subcortical hemorrhage in the region indicated by cerebral localization, attention must be directed to the lenticulo-striate artery. This vessel (described by Gray as the largest of the antero-lateral ganglionic branches of the middle cerebral) is called by Charcot the "artery of cerebral hemorrhage" from the frequency of rupture. The point at which it most frequently gives way may be reached by cutting about one inch in the direction of the lateral ventricle just behind the lower end of the Rolandic fissure or in the tempero-sphenoidal convolutions at the upper margin. If not found here further exploration is scarcely advisable, though personally I should extend the cut first made so as to open the lateral ventricle, as in Case 4 presently to be related.

The clot being found, the cavity made by it is thoroughly cleaned out with the finger and irrigated with sterilized water at a temperature of 105 degrees. Any bleeding vessel must be caught (if possible) and tied with catgut as elsewhere in the body. When the cavity has been washed out a few strands of catgut are inserted through the cut in the brain, left long enough to protrude through the dura and scalp; or if the ventricles have been opened a very small drainage tube may be put in as advised by Keen. The dura is now closed by a continuous catgut suture —except at the point of drainage—and the scalp also in a similar manner. An abundance of iodoform gauze is placed around and over the opening, with much bichlorid gauze and cotton over all, properly held in place by bandages.

Of the second: when the bleeding point is found but for any reason can not be caught and tied, to check the flow one must first irrigate carefully and then pack the wound tightly enough to stop the hemorrhage. This method of treatment is not satisfactory because the gauze causes as much intracranial pressure as the clot and so the bad symptoms continue; but the packing need not remain more than thirty-six hours and may be very gently removed at the end of twenty-four hours if specially irritating. Improvement will be noted at once. (Even hemorrhage from the superior longitudinal or lateral sinuses may be controlled in the same manner, but the gauze must be left as long as forty-eight hours in such cases.)

Of the third: Victor Horsley first demonstrated, by experimental work on monkeys, that ligation of the common carotid upon the affected side checks the flow of blood in a ruptured lenticulo-striate artery as well as in the middle cerebral, the collateral circulation through the circle of Willis being at first very slight. The temporary cessation of the flow thus secured allows the bleeding to stop, and subsequent collateral circulation does not give rise to secondary hemorrhage. As ligation of the carotid can be done easily and as if careful antiseptic precautions be observed primary union may be obtained, the operation is perhaps justifiable if performed inside of three or four hours, since by arrest of the carotid stream the clot may not become as large as might be the case if the vessel were left to bleed indefinitely; and so permanent hemiplegia, softening, etc., may be prevented in some cases. But it is not permissible to do this later than six or eight hours after the onset of coma.

CASES.

That the first rule laid down as favorable to operation is not without its exceptions is shown by the following case:

Case 1.—Thomas L., patient of Dr. J. E. Moses, of Rosedale, Kansas, received a blow upon the head which was followed by symptoms which pointed to hemorrhage in the lower Rolandic area and tempero-sphenoidal region of the left hemisphere, without evidence of fracture. I opened the skull low in the temporal region and removed a large clot from beneath the pia, which came from a rupture of the parieto-sphenoidal branch of the middle cerebral artery. The patient stood the operation well, all the symptoms of compression disappeared and we began to hope for speedy recovery. We were sure there was no possibility of contamination during the operation and the same care was observed at the first dressing when the drainage was removed. So we were greatly surprised when a meningitis arose soon after operation; which proved fatal six days after the injury. The autopsy showed a fracture of the base communicating with the middle ear—hence the meningitis and death.

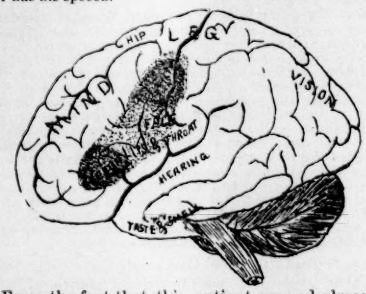
Here is a case that doubtless might have been cured had there been no complicating fracture of the petrous portion of the temporal bone through which a meningitis from infection sprang. A peculiar feature was that there was not, from first to last, a single symptom—save the meningitis—which indicated fracture of the base.

A case illustrating the second rule was reported by myself some two years ago in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. The points of interest may be briefly summarized thus:

Case 2.—Dr. W. C. B., in June, 1891, consulted me about an attack of temporary aphasia and paresis of the right hand, arm, foot and leg; this passed away in a short time, leaving him entirely well but anxious. I diagnosticated a slight surface hemorrhage, and prescribed potassium iodid for possible tertiary trouble. Oct. 10, 1891, I was called to Carthage, Mo., by his physician Dr. R. T. Scott. He had had (about ten days before) a return of the aphasia and partial paralysis which passed away after a few minutes. He started for home some little time afterward but fell, totally unconscious and hemiplegic. In the interval between the "stroke" and my visit he never entirely regained consciousness; the hemiplegia was complete and though he could be aroused to a sufficient degree to understand simple things he could speak no word. During the few days immediately before my examination he had been failing very fast as indicated by rapid emaciation, paralysis of the bladder, dysphagia and fever (temp. 100 to 101 degrees F.) with terrible headache and insomnia; strength failing very rapidly. I therefore decided that the patient would die and that he should have the benefit of operation. I opened the skull over the motor and speech centers and found no pulsation of the dura which bulged into my large opening. Upon incising the dura the brain presented a discolored appearance and softening of the arm and speech centers seemed to have begun. The clot underlaid that portion of the cortex which presides over speech and motion of the face and extremities of the right side, and had exerted so much pressure upon other parts of the hemisphere as to render them blanched. The area of the clot is represented approximately in the accompanying diagram.

After removing the softening mass, including a part of the arm center, I irrigated with hot bichlorid solution, 1 to 6000, put in catgut drainage and closed the wound, replacing a part of the bony tissue removed. The duration of the operation was one hour and thirty-five minutes—some time having been lost on account of difficulty with the anesthetic. At one time we thought the patient would die upon the table, but he was put to bed in good shape. After closing

the scalp it was discovered that normal brain pulsation had returned at the opening in the skull. He slept nicely all night—quite a contrast to the moaning and tossing of two or three previous nights of insomnia for which sulfonal and morphin (gr. ¼) had given no relief. At 9 A.M. next day he appeared much brighter and nodded and smiled when asked if he felt better; the headache was gone; considerable motion in foot was obtainable upon requesting him to move. Improvement continued from that time on—the temperature being normal, and primary union being obtained. He sat up on the fifth day and on the twentieth day after operation rode more than two hundred miles. The subsequent history is one of restoration to health with ability to walk and care for himself; but the use of the hand has never been regained, nor has his speech.



From the fact that this patient seemed almost *in articulo mortis*, I am satisfied that the operation saved his life and probably had much to do in preventing permanent paralysis of the leg. Sometimes it is possible to give some relief even after a considerable time has elapsed, as is shown in a case almost precisely similar to the one just mentioned, the interesting features of which I will relate:

Case 3.—I. M., of Oklahoma, age 54, came under my care in June, 1892, affected by complete hemiplegia and aphasia due to a cerebral hemorrhage which occurred more than three months before. He complained of much headache upon the left side, insomnia, and general ill health; at times homicidal and suicidal tendencies had been noted following periods of sleeplessness and great irritability. I sent him to the hospital and with the assistance of Drs. T. B. Thrush and J. C. Maxson operated. I removed three one-inch buttons over the leg, arm and speech centers, and joined these openings with bone forceps, placing the fragments in hot bichlorid solution, 1 to 4000. On opening the dura no evidence of hemorrhage was to be seen except a white infiltrate over the speech and lower part of the arm centers. Believing there had been a rupture of the lenticulo-striate artery I cut through the brain to the region of the internal capsule. A large quanty of broken-down brain substance immediately oozed out; so I extended the incision upward and introduced my finger into the cavity, removing two fragments of the clot, each about an inch in length, together with a lot of *débris*. I then irrigated the cavity with sterilized normal salt solution, established drainage with several strands of catgut, stitched the dura and replaced the pieces of skull in a kind of mosaic, carefully suturing the scalp and applying a gauze compress so as to hold them in place; with the usual dressings.

Convalescence was speedy and uneventful. For three days there was a little fever (100 degrees F.) and no improvement was to be seen. But at the end of that time the temperature became normal, all the distressing head symptoms disappeared and then motion began to return slowly in the affected side. In a few weeks the patient was walking around by the aid of a cane with but little difficulty. Motor power has never returned in the hand, but the arm and forearm now have some motion. Speech was not restored. The bladder irritation and obstinate constipation—so prominent before the operation—entirely vanished, the mental symptoms never recurred and the patient regards himself as vastly improved.

The only case upon which I have operated which comes under my third rule was this:

Case 4.—J. P. E., male, age 52, a patient of Dr. Kistler, of Kansas City, I first saw at 4 P.M., on March 31, 1893. I found a hemiplegia of the left side which came on thirty-two hours before, while he was straining at stool; for some hours previously he had complained of vertigo, and had mentioned a "bad feeling" in the head and a heaviness of the left hand and foot two days before, at which time he went to bed with some vomiting—ascribed to biliousness, and for which a cathartic was administered; from this came the straining which caused the bleeding. He had a temperature of 100 degrees F. His mind was not much affected until more than twenty-four hours after the attack, but for eight hours there had been wild delirium and at the time of examination he suddenly became comatose. A severe convulsion would occasionally appear upon the paralyzed side, from which I expected to find a hemorrhage just beneath the membranes. I therefore ordered him to be carried to the German Hospital.

At 9 P.M., coma was complete, so without any anesthetic I opened the scalp and removed a piece of skull two inches by four inches over the motor area. The dura was very tense and pulseless and upon cutting the dura the brain protruded prominently into the opening; at which relief of pressure the patient began to show such signs of returning consciousness as to require a little chloroform. There were no surface indications of hemorrhage, so I cut inward through the parietal convolutions until the greatly distended ventricle was reached. Here there was a large quantity of semi-fluid blood, and broken-down brain tissue, which I removed as gently as possible and then irrigated with hot normal salt solution. As oozing into the ventricle continued persistently a little iodoform gauze was gently packed in the wound and the ventricle and allowed to protrude through the dura. Bulging of the brain was far less marked and after the dura was sutured around the gauze packing, cerebral pulsation was found to have returned. The usual dressings were applied.

At 10 A.M., April 1 the patient died—the attending physician said from "shock." Owing to my departure from the city no autopsy was held, so the source of hemorrhage was never determined.[1]

ORIGINAL ARTICLES.

SEVEN CASES OF CEREBRAL SURGERY.

BY C. E. RUTH, M.D.

PROFESSOR OF DESCRIPTIVE AND SURGICAL ANATOMY, KEOKUK MEDICAL COLLEGE; PROFESSOR OF CLINICAL SURGERY AT ST. JOSEPH'S HOSPITAL, KEOKUK, IOWA.

Believing that cerebral lesions not accompanied by fracture or even trauma represent a large proportion of the cerebral cases requiring relief at the hands of the surgeon, I present the following cases in support of that view:

Case 1.—May 9, 1891, was called to see L. G., age 5 years, who had four days previously sustained an injury by falling fifteen and one-half feet, striking her head on a plank sidewalk. No evidence of fracture of the skull was found at that time or subsequently. She slept eighteen hours in twenty-four, temperature 99.5, pulse 72. Sensation and muscular coördination normal. Appetite was good and bowels regular. Slight mental hebetude. Right side of head and face greatly swollen and discolored. Extravasation of blood under the ocular and palpebral conjunctiva. Left pupil responded to light readily. Swelling prevented inspection of the right pupil. A small swelling was found to the left and slightly behind the bregma.

Diagnosis, intracranial clot. Operation was made as soon as possible, the small swelling to the left of the bregma was cut down upon and a clot turned out

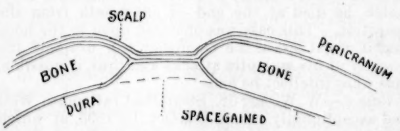
[1] I believe this man would have been saved if the operation had been made a few hours earlier, before the blood broke into the ventricles. That my patient died is no objection to the rule I have given, as a number of cases of progressive hemorrhage have been treated surgically by other operators with brilliant results.

which had formed between the bone and pericranium. Removal of a small disc from the center of this pericranial denudation brought another clot into view, which had formed over the anterior branch of the middle meningeal artery between the dura and anterior border of the parietal bone. Recovery was complete in two weeks without event.

Case 2.—C. B., age 71 years was struck Feb. 22, 1892, by the limb of a tree weighing eighty-five pounds which had fallen forty feet. The blow was received slightly to the right of the median line and in front of the fronto-parietal suture. The scalp wound indicated that the blow glanced slightly backward. I did not see the patient for several days after the injury, at which time the scalp wound had healed. Muscular incoördination marked and memory *nil*. Left patellar tendon reflex was abolished. Owing to dangerous cerebral compression symptoms, and noting no improvement in his mental condition on March 10, 1892, I trephined his right parietal bone beginning at the posterior part of the old scalp wound and extending backward three inches. On opening the dura a large amount of subarachnoid fluid was discharged. No clot was found. There was no laceration of cerebral tissue but arterial and especially venous engorgement was marked. Recovery took place without incident and was complete in three weeks. This patient was entirely relieved from former severe headaches which had occurred every two weeks for many years.

Case 3.—Jan. 18, 1893, I was requested to be present at an autopsy made by Dr. Kinnaman on J. T., aged 9 years, colored, who had died suddenly at his home under suspicious circumstances. Removal of the scalp showed contusion of its under surface, one and one-half inches in diameter, behind the fronto-parietal suture and to the left of the bregma. Removal of the skull cap showed an immense blood clot which extended from vertex to base and covered almost the entire left hemisphere of the cerebrum. The cause was evidently a blow on the vertex at the site of the scalp contusion and probably produced almost instant death. The skull in this case was very thin and possessed great elasticity. No fracture of the skull.

Case 4.—This case I place here out of order in point of time because it is traumatic in origin. Oct. 10, 1895, Peter V., aged 9 years was brought to me with a history of injury received in September, 1894, while in a wagon drawn by a badly frightened horse in a runaway. The nose was broken and driven backward and when I saw the case four months after injury, I found a scar crossing the nose at lower end of nasal bones, well out upon the left cheek, and about an inch to the left of the median line a small sinus discharged pus in considerable quantities. Pus was also being freely discharged from both the lachrymal sacs. The parents said that his nose though raised considerably at the primary dressing, was not its usual height. He was unconscious twenty-four hours after the injury, then appeared to recover completely save the discharge of pus previously mentioned which had been continuous since three weeks following the injury. Within four weeks he begun vomiting in the morning about 4 o'clock and then vomiting occurred at irregular intervals during the day up to the present. Parents noticed that for the past month he has not been as bright intellectually as normal, could not say some words he formerly spoke well, did not see well, could not grasp anything firmly with the right hand and dragged the right foot. Would fall if he was not steadied when he attempted to walk. Pupils responded pretty well to light but a little sluggishly; convergence was impossible. Eye movements otherwise normal. Temperature normal, pulse 70. Diagnosed cerebral traumatism, with secondary degenerative changes in the left frontal lobe extending well backward near the middle line and towards Brocha's convolution. Trephined the left supra-orbital region. The pulsating dura bulged strongly into the opening. All the membranes were adherent from former inflammatory changes and the cerebral tissue greatly softened. With a cataract knife and small trocar I explored the major part of the anterior left frontal lobe, but found no fluid accumulation of any kind. Some broken-down cerebral tissue was removed, one-half inch opening was left in the dura and large gauze drain introduced. I could find no fracture of the horizontal plate of the frontal bone. Drainage was maintained for three weeks and at least calculation three drachms of broken-down cerebral tissue and old clot was discharged. Improvement in his mental condition was prompt, soon appeared normal, and he was able to speak any word that he had formerly known. He was able to walk without aid of any kind within one week after the operation. Great swelling occurred of the palpebral tissues with eversion of the conjunctiva. At the end of the second week tears were discharged at the old drainage points in the forehead but are now closed. Though the wound was dressed daily no suppuration has taken place.



It is too soon to make a positive declaration of the results in this case. The remnant of an old blood clot which seemed to be the basis of the bond of union between the membranes was almost certainly produced by the original injury, and forces one to the conclusion that early operation would almost surely have saved this boy much of the danger through which he has passed with better prospect of perfect recovery. In each of these cases there was no fracture, and the ages were from 5 to 71 years, yet in each there was a serious if not a fatal lesion. The only rational treatment must be that of removal of the products of trauma, whether that be blood clots, increased accumulations of cerebro-spinal fluid, abscess, or devitalized cerebral tissue. By early operation we may hope to give the damaged brain a chance of restoration by improvement in its circulatory possibilities before permanent impairment of function, paresis, paralysis, epilepsy, idiocy or death of the individual. In Case 3 death was probably instantaneous. In Cases 1 and 2 operated upon, one in four days, the other three weeks, recovery was perfect.

We have no hesitation in saying that all cases of cerebral trauma not accompanied by fracture in which symptoms of compression, dangerous, pronounced and persistent motor or mental disturbance

occur should be operated upon. No age is exempt from traumatic intracranial lesions without fracture, as is shown by my three cases in children and one in a man of 71, as well as a case reported to me by Dr. Gaston of a man 50 years of age who received a blow on the occiput which produced rupture of the middle meningeal artery under the anterior part of the parietal bone which was fatal from secondary inflammatory trouble about the clot. No fracture. The site of the application of the trauma or the course of the branches of the middle meningeal artery will indicate the points to be explored in the absence of localization symptoms. We can see the necessity for a guarded prognosis and can not pronounce our patients positively well till the lapse of many weeks or months, and should keep them under observation so as to detect the first evidence of danger.

Case 5.—E. B., age 36. Epileptic since 14 years of age. Memory and general intelligence greatly impaired. Nystagmus pronounced. General health good. Paretic on left side from infancy, with very little use of the left hand and drags the left foot. Convulsions started in the left side to which they were confined until they became general ten years ago. No history of injury or marked assymetry of the skull. Jan. 14, 1894, I removed three inches of bone over the fissure of Rolando, and identified the arm and leg centers with brain electrode. Convolutions were defective in development, pale, and widely separated by broad and shallow sulci. Recovery was prompt and apparently complete in two weeks and the relatives thought they noted marked mental improvement but that is to be taken with considerable allowance. He contracted double pneumonia from which he died at the end of one month from the operation. This case was operated upon in the hope that it might lessen the frequency and mitigate the severity of his epileptic attacks and thus, if possible, save what intellect he had.

Case 6.—W. W., age 38. Steamboat raftsman. Well and exceptionally strong till Oct. 18, 1893, at which time he became suddenly and completely paralyzed in the left arm and leg. He was infected with syphilis eighteen months previously. April 14, 1894, six months after the onset of the paralysis, I diagnosed the cause of the paralysis to be embolic obstruction of the ascending parietal and frontal arteries to the motor area of the right side, and removed three and one-half square inches of bone along the fissure of Rolando. Brain was anemic, pulseless, did not bulge into the opening, and no muscular response could be obtained by the electrodes beyond a general tremor. No abnormal resistance could be detected. Recovery was complete from the operation in three weeks and at the end of six weeks he was able to walk by the aid of a chair, but the gain that was at first promised in the arm was not maintained. His skull was scant one-half inch thick and composed almost entirely of dense compact tissue. He left the city at the end of seven weeks but returned in October, 1894. Nov. 17, 1894, I did a secondary operation on him before the Eastern Iowa District Medical Society, in which I nearly doubled the space from which the bone was removed, being mainly extensions backward from the upper, and forward from the lower end of the Rolandic fissure. Improvement following the secondary operation has not been as marked as that following the first one, and is probably due largely to the lapse of time since the primary lesion and teaches us another lesson in promptness. He can now walk by the aid of a cane.

This case would seem to indicate that reduction of the cerebral tension to below normal by removal of bone and establishment of drainage, may bring about considerable restoration of function in portions of brain supposed to be damaged beyond the possibility of repair, from embolic obstruction of a terminal artery. At the secondary operation in this case, I learned that the edges of the old opening were beautifully beveled, equally from the outer and inner tables, and that the pericranium and dura were blended to the opposite side, so that the actual gain in cerebral space is represented by one-half the thickness of the bone, less the normal convexity of the part, for the membrane will pass directly across from the bony attachment at one side to that of the other, if it is not carried outward by intracranial pressure. From this, it will be seen that the gain in cerebral space, by removal of the skull, will be relatively greater with a small opening. In this case it was nearly one-fourth inch, for the thickness of the skull was scant one-half inch. This relief of tension may also enable neighboring parts of the brain to take up part of the work of a destroyed or crippled center, as is the case where a center is excised.

Case 7.—Nellie P., age 5 years. Was well until after a fall at the age of 1 year, at which time she could walk and talk some. Following this fall she had nine convulsions in three weeks. Three weeks later she had spasmodic contractions of the entire left side for twelve hours, followed by complete paralysis of the left arm and leg. Twenty days later she had an intense fever accompanied by general convulsions for eight hours, closing with movements only of the left side. She has never spoken since the attack and could not walk again until one year ago. Drags the left leg and does not use the left arm. Now has frequent general epileptic seizures and is idiotic. May 23 did right-sided craniectomy and removed three inches of bone over the fissure of Rolando. Found defective development of the cerebral convolutions. There was no assymetry of the skull and no evidence of fracture. Though I am convinced that this patient sustained a cerebral injury from the early fall, which prompt and intelligent surgery might have readily recognized and removed, the time for such procedures had gone by. She took the anesthetic badly and died in eight hours.

Early signs of collapse in this case prevented application of electrical tests for the motor centers, and the ultimate result has not lessened my skepticism regarding the justifiability of craniectomy operations in cases of idiocy, even if due to traumatism when there is no assymetry of the skull, and the history of injury dates back to early life and has been of several years' standing. In the adult we can hardly expect marked improvement in motor disturbances after the lapse of one year with or without operation. In Case 6, paralysis of the arm occurred twelve hours before that of the leg, and would indicate that the ascending frontal and parietal arteries arise by a common trunk from the middle cerebral; the ascending frontal was first plugged and the embolism, probably specific in origin, developed backward so as to involve the ascending parietal in twelve hours and thus produce complete paralysis of the motor area of the opposite side.

WHEN SHOULD CONGENITAL CLEFT PALATE RECEIVE SURGICAL TREATMENT?

Read before the Chicago Dental Society.

BY C. S. CASE, M.D., D.D.S.
CHICAGO.

This is a subject upon which there is a decided difference of opinion among eminent specialists who pursue distinct methods of treatment. I believe this to be mainly due to the fact that in the two general classes of treatment for congenital cleft palate, that which relies upon artificial means for its success is performed by the dental profession, while the other, or surgical operation, is confined almost entirely to the medical profession. And as in other instances, when these two professions are called upon to treat the same character of disease or deformity, there has never been in either profession an intimate knowledge of the method of treatment peculiar to the other, or an appreciation of its inestimable advantages in certain conditions. Were the relations of the two professions of a more intimate nature, these things might become so adjusted ethically as to render interference at times by one or the other inexcusable and, possibly, subject to the law of malpractice.

Dr. Norman Kingsley, of the dental profession, who has doubtless had the largest experience in the treatment of congenital cleft palate by the artificial method, has published the following radical opinions in reference to treatment in this deformity: "The only cases in which surgical interference is justified are those rare ones of slight separation and with an abundance of tissue where the division of the muscles would not be essential to success. Of the hundreds of cases that might seek surgical aid, very few would come under this exception; and although the practice has been tested in a thousand cases by the most eminent surgeons of their time, it has resulted in such a uniformity of failure, considered as a beneficent operation, that it should have been utterly abandoned long ago."

Although this never could have been written with a full knowledge of the success of surgery when employed during babyhood, or at a time, I claim, when surgical interference should be considered as imperative as the operation for lacerated perineum and other conditions which are discovered and demand surgical treatment as early as advisable after birth; yet most unfortunately it is true, that almost every professor of surgery in medical colleges, who has had more or less experience in operating for congenital cleft palate, will perform this operation before his class upon every patient who presents for treatment, of whatever age or condition of cleft, or tissues.

I can understand how there may be an occasional case of cleft palate with sufficient redundancy of tissue to warrant a skillful surgeon in attempting an operation for a patient after the age of 5, 10, or even 15 years, and with every probability of obtaining a natural palate that will meet all the requirements of speech. But successes of this kind are so very rare they prove nothing, neither do they justify the wholesale attempts that are made where there is no possibility of doing more than to surgically unite the borders of the cleft. And far too often, as Dr. Kingsley says: "When the only apparent object was to gain *éclat* by the skillful use of the knife in a difficult case before an admiring audience, and with no possible hope of even a union or surgical success."

Surgical success in these operations consists apparently in a permanent closure of the fissure by uniting the tissue along the border of the cleft. But this is not success, unless the only real object that is worthy of consideration under the circumstances can be attained, *i.e.*, a palate which in conjunction with the pharyngeal muscles will enable the patient among other things to completely close the naso-pharyngeal passage. This is absolutely necessary for perfect speech; not only to obtain the proper quality of tone, but to enable them at times to forcibly expel all the air, which is the vehicle of voice, through the mouth, and often through a narrowed opening with intensified force,—as in speaking the words hiss, hush, etc. And again, in those vocal interruptions which can only be perfectly produced by a complete closure of every avenue of escape of an accumulated pressure of air, with the production of a sudden vocal explosion at the lips, or between the tongue and different locations along the roof of the mouth or palate, as in pronouncing the letters B, T, K, etc.

I have been told recently by an eminent surgeon that even after a staphyloplastic operation, the velum palati could be surgically extended to any desired length. This is a claim which I believe is not justified by anything which has yet been accomplished. If so, a practical proof would be hailed with joy and go further towards establishing this very doubtful claim than the bare assertion of any man however eminent.

It has been my intention for some time to bring the subject of this paper prominently before the surgical profession for general discussion, with the hope that it might lead to a careful comparison of the advantages of artificial vela and obturators, with the surgical operation known as staphyloplasty in congenital cleft palate.

In presenting this paper to the Chicago Dental Society, I feel very much like apologizing for occupying your valuable time with a subject relative to which so few dentists are actively interested; and yet it has seemed to me eminently proper that a question relative to an operation which in all its branches belongs distinctively to dental and oral surgery should emanate from a dental society, whatever larger influence I may hope for it in other quarters where only one branch of the operation is so unhesitatingly practiced under all conditions, and where little is really known of the other from a practical standpoint.

I shall not go into the causes and differential conditions of cleft palate, or attempt a detailed description of any particular method of treatment; but will endeavor to treat the subject from a popular standpoint, taking it for granted that my hearers of the dental profession are sufficiently well informed in every branch of this subject for the purposes of this paper.

What is the principal object of the patient, or friends of the patient, in submitting to an operation of this kind? It is almost invariably for the purpose only of perfecting or benefiting articulate speech, which is often so impaired in tone and vocal articulation as to destroy every hope and possibility of a life that otherwise would be an ornament to society and successful in every undertaking.

At the close of last year's term of school, I received a letter from a young man who had come to me two

years before with speech so imperfect as to be understood with the greatest difficulty, and for whom at that time I inserted an artificial palate. Accompanying the letter was a program of the graduating exercises of the High School of Manistee, Michigan, in which he was down for the "Salutatory," having been given the highest honor of his class not only, but a position which could not be properly filled by a person with indistinct or imperfect utterance of the English language. The following is a part of his letter: "I have sent you under separate cover an announcement of the graduating exercises of the class of '94, of which I am a member, thinking you would like to see the part you have played in the exercises. For I owe it to you that I am to take part." He has since written me from the University of Michigan, where he is taking the classical course with high anticipations of the future because, as he says, his friends now tell him that he speaks with perfect articulation.

This is only one of many similar instances in my practice and the practice of other specialists, showing the perfect success of artificial palates that have been inserted after the age of 15.

For the purpose of bringing before you unquestionable evidence of the value of the artificial method of treatment in congenital cleft palate, I have selected from my *clientele* two patients who are with us this evening, whose experience as regards time in wearing an artificial palate is widely different. The one gentleman, now 30 years of age, began about 15 years ago, while the other, a young man 19 years of age, will be remembered as coming before this society a year and a half ago, two weeks after the insertion of his first artificial palate. At that time he was presented by me merely to show the improvement principally in the quality of his tone, and in certain enunciations that were previously impossible. When you hear these gentlemen speak, as they have kindly consented to, after the reading of my paper, you will be convinced, I think, that were you to meet either one in private conversation—where the opportunity of using a lower tone than is possible in this hall would be greatly to their advantage—that nothing in the character of their speech would suggest the deformity under which they labor.

The treatment for congenital cleft palate of whatever character, is usually the crowning event of a patient's whole life; for upon its success in enabling him to speak distinctly depends his future. It is often the one event for which they have been saving and looking forward to for years; and what is of a far more serious nature in throwing the responsibility of a being's future upon the operator who attempts the correction, it is usually the only operation they will undergo, whatever its final result. By this I do not mean they will not allow the operator to perfect or improve his first operation; but that after they have first investigated the subject of treatment, choosing the method which seems to promise the greatest benefit, and the operator upon whose skill so much depends, they usually will forever abide by the consequences. In some instances their means will not permit a second outlay of money, to say nothing of other things, for a second or different operation, the success of which they have much reason to doubt. In other instances, if the operation is a surgical one, which is successful only as to the perfect union of the fissure without material improvement in speech, or with an improvement which is not equal to that which certainly could have been obtained by a skillfully adjusted artificial palate, the latter operation is rendered impossible, unless the cleft is disunited for the proper insertion of the artificial velum, an undertaking that will rarely be submitted to, even if it were possible for results equal to those which might have been obtained in this way at first.

Of the hundreds that are yearly added in private and hospital practice to the list of patients having a partial or complete disunion of a once surgically united cleft palate, few ever apply for a second operation of any kind for various reasons. It is doubtful if many of these patients could acquire the ability to successfully use an artificial palate with the muscles of the natural velum and uvula stiffened and contracted by the cicatricial tissue of the operation, when so much depends upon the mobility and sensitive activity of the natural muscles in acquiring the power to properly use an artificial velum as an adjunct of speech; just the same as the muscles of the hand acquire the ability to use an instrument of any kind in the accomplishment of an object which could not be attained without that particular instrument skillfully fashioned for the purpose and made to do the bidding of muscle and brain in the production of beautiful music or the restoration of a decayed tooth. If the muscles have lost the possibilities of their natural cunning, either by disease or by a surgical operation, the most perfect brain and instrument are powerless to accomplish more than indifferent success.

When patients have come to me from time to time with a surgically united cleft, realizing the inadequacy of their operation and with the hope of improvement by artificial means, it has been my custom to tell them that nothing could be done without first opening the suture, at least through the soft palate, and then with no promise of success beyond the probability of an improvement in their speech.

I have one patient who is at present the Auditor of the Toledo & Ann Arbor R'y, who underwent surgical treatment for congenital cleft palate when quite a boy at the hands of those eminent surgeons, Drs. Agnew and Garretson. I found the soft palate perfectly united, but anterior to this in the hard palate there was an ovoid fissure about the width of a cent. This was covered by a plate with a flexible extension made by Dr. Patterson, of Kansas City. When I first met this patient, about six years ago at Jackson, Mich., he was very skeptical as to the benefits of any mode of treatment. He was accompanied by his sister who had brought her daughter, who was suffering from the same deformity, for consultation, or rather for investigation of my method of treatment. When I heard his strongly expressed doubts as to my ability to render a service that would enable his niece to speak perfectly, I privately sent for one of my cleft palate patients, whom I introduced to them with no explanation. After quite an animated conversation, in which my patient did most of the talking, I told them that the young man was wearing one of my palates. At this they were greatly surprised and could hardly believe it until they had examined the palate and saw the cleft which was very large and apparently quite difficult to treat. It is needless to say that this decided the operation for his niece which proved so successful that later—about three years ago—he insisted upon my making the attempt

to construct an artificial palate for him without opening the suture in his soft palate. I found upon trial with a certain form of flexible rubber palate that the requisite posterior extension or veil of the palate could be rolled up and thus thrust through the fissure, where it was firmly buttoned in place by a lingual extension of the rubber. When in place, the artificial velum now unrolls to the proper width and extends fully three-fourths of an inch beyond the posterior border of the surgically united palate, without even then coming in contact with the posterior pharyngeal wall, until raised by the muscles in the act of closing the passage to the nose, on the principle of a valve, the same as all artificial vela are successfully worked. This instrument he has used quite successfully, and, as he writes, "with marked improvement in his speech; especially in using the telephone which had previously given him much trouble."

We have with us this evening a gentleman about 30 years of age, who was also operated upon surgically when a boy with the usual result to speech, so far as I can learn, of all operations performed after 5 or 10 years of age. When he came to me about six months ago I found the fissure perfectly closed, but with the velum palati so rigid and short that it could not be made to reach within a half inch of the posterior pharyngeal wall, in consequence of which his speech was quite imperfect, especially in quality of tone and in those vocal enunciations which require a complete closure of the naso-pharyngeal passage. After weeks of consideration, he finally consented to have the suture opened through the soft palate for the introduction of an artificial velum, which you will find has brought about an improvement in his speech that is not often possible in so short a time under the most favorable circumstances for patients at his age.

The next patient I wish to present to this society is a woman upon whom as perfect a staphyloplastic operation has been performed as is possible. You will find upon careful examination of this case that the operator has taken advantage of the most approved and modern method of cutting those tense palatal muscles on either side which have so often been the cause of ultimate disunion of the suture on the one hand, and, on the other, when union has been permanent, in a tenseness, immobility and shortening of the velum that aborted its every possibility of becoming a useful adjunct of speech. I do not wish to be understood as exhibiting this patient—who now speaks so imperfectly as to be understood with the greatest difficulty—as a fair sample of the invariable result in speech arising from a staphyloplastic operation, for I have met with a number whose vocal articulation was far more perfect. On the same principle also, this is true of many with open clefts who have received no treatment whatever. My main object in presenting this case is to show a condition which may follow the most skillful and successful operation—considered from a surgical standpoint—performed during adult life with every advantage of an abundance of palatal tissue, and one which I have good reason to believe is a fair sample of the relative improvement to speech in a large proportion of all staphyloplastic operations that have been performed later than infancy, or very early childhood. I also present this case as an illustration of what many skillful surgeons are willing to attempt for patients even older than 40, with no probability of success considered as a beneficent operation, and with nothing in fact but the bare possibility of surgically closing a fissure that has never given them trouble beyond the disadvantage of imperfect speech, which their operation can not remedy. It is a sad commentary upon surgery when its most skillful operators are willing to subject some poor human being to an operation that causes great suffering, with loss of time and money; and worse than all, places him beyond the pale of possibilities that might result from other hands.

Unfortunately, these instances are not confined alone to the medical profession, but have arisen from the ambition or cupidity of skillful dental oral surgeons whose education should give them a perfect knowledge of the advantages of the artificial method. Why would it not be far more commendable for these gentlemen to allow, and even advise, such patients to first try the artificial method, and then if that fails, the surgical operation could be performed as well—a thing which can not be said of the artificial method if the operations are reversed as to time.

To recapitulate the claims of my paper, the first point I have attempted to make and conclusively prove is that the artificial method of treating congenital cleft palate for patients under 15 or 18 years of age can be relied upon when skillfully performed, as furnishing a sure means by which may be attained perfect vocal articulation, free from the undesirable nasal tone which is characteristic of this deformity. And while the same success can not always be promised at a more advanced age, a decided improvement in speech has invariably resulted in all cases where I have been allowed an opportunity to properly develop the artificial palate according to the needs and possibilities of the muscles; and, on their part, there has been a proper persistency in training the voice to speak distinctly. There are many instances where patients have begun wearing artificial palates as late as 30 years of age whose speech in ordinary conversation would not produce a suspicion of their deformity, as instanced by one of the patients whom I shall present at this meeting.

2. With the surgical method of treating cleft palate, when performed later than infancy or very early childhood nothing like the above results have been attained, with perhaps an exception in a few isolated cases. Certainly nothing to warrant the most skillful surgeon in operating, as they commonly do, for patients older than 20, or even 10, where the cleft extends partly through the hard palate, and with the tissues of the soft palate comparatively scant from non-use during the age of its growth and development.

3. When should congenital cleft palate receive surgical treatment? I answer most emphatically, as soon after birth as safety to life will warrant. But after 5 years of age and even earlier, be the cleft great or small, the operation should be performed only in those rare instances which promise an unquestionable assurance of resulting in the desired length and mobility of the united velum palati.

The following is taken from the approved minutes of the January meeting of the Chicago Dental Society at which the above paper was presented:

"The several patients to whom Dr. Case made reference in his paper were presented to the society, and through the medium of short extemporaneous speeches demonstrated the fact that in every instance

their power of speech was fully in accord with his claims.

"One young man gave a remarkable exhibition of his ability to whistle, which was a surprise to all who knew the impossibility of performing this function with a cleft of the palate, unaided by surgical or artificial means."

A. H. PECK, Secretary Chicago Dental Society.

SLEEP THE RESULT OF DIFFERENTIATION.

BY GUIDO BELL, M.D.
INDIANAPOLIS, IND.

SYLLABUS.

There are no atypical cells in the organisms; for this reason and others there must be something guiding all biologic processes—species in action is identical with vitality.

The fundamental functions are assimilation and proliferation; differentiation is the tendency of bringing assimilation and proliferation in contact with the outer world under most favorable conditions.

These influences are either food and air or disengaged (cosmic) energy. Food is preëminently chemic change and is carried on a neutral road through the body; cosmic influences are carried in an electrical form also on neutral roads. Blood and nerves are neutral in consequence of their metaplastic nature as hair and nails are.

All biologic phenomena are subject to the law of conservation of energy but controlled by species.

Trypsinogen and inogen are transformed by a specific irritation into trypsin, or mechanical force, respectively. Similar to this, we have to assume a product in the cerebral cell which, on irritation, becomes an "imprint" consuming oxygen. The nerve cell puts itself asleep.

It is proper and correct that "experimental science ought to vigorously forbid itself all research relative to first causes." But excluding such a research as not pertaining to experimental science we have taken our aim too short in physiology.

Within the last fifty years, since medical sciences have been conceived from the standpoint of induction and taught so in regular schools, it became evident that medical practice did not make equal progress as science did, and that American medical practitioners with less schooling can well compete with their European colleagues.

The cause of this seems to rest in the fact that the young practitioner can not translate easily the language of science into that of practical life. It is difficult for him to get the essentials of a phenomenon by abstraction and to compare them with his doctrine. He learns using terms without a clear conception; he speaks of constitution, temperament, vitality and so on and refers to them in his judgment and action.

It seems to be just and commendable to draw forth these terms from indistinctness, and to lay down the "known" and the "knowable" but not yet known.

My endeavor is to plead in this article on sleep for the term, vitality. I choose an object to be concise and clear, and I select sleep because she, a natural healer, offers the best opportunity of viewing nature's workshop.

I define vitality as the metaphysical principle active in the development of the individual and in procreation. Both changes and disorders, inherited and acquired in life, must be included in a given case. Vitality is identical with species or type. I will try to show that the law of conservation of energy can not be understood in biology if not placed under the control of species. Only such forms of energy are disengaged in the cell, and so much of each as are in accord with its design.

Sleep is a normal condition of the human body; it is periodical rest with a higher or less degree of unconsciousness due to inactivity of the nervous system. Not only the avenues by which we receive impressions are closed, but also the mechanism through which our various relations with the outer world are maintained and regulated, is cut off.

But not all organs sleep; some find other means to be equal to their duties. This variation is explained by the laws of differentiation.

All biologic functions must be studied in the simplest forms of life—the cells. The cell consists of a cell wall, plasm and a nucleus. But some living matter has been observed without a cell wall and even a nucleus can be missing. Thus in the simplest living being there is nothing but protoplasm, a network holding together a gelatin or fluid, and consisting of carbon, oxygen, hydrogen and nitrogen.

But life is not mere chemic change; it is rather chemic change in the services of the metaphysical principle of species which in juxtaposition develops the individual and in postposition creates the offspring. (Juxtaposition and postposition are inadequate terms, because the individual is not made, but procreated and developed.)

We must accept the metaphysical control for the following reasons:

1. Every cell and every organ in the human body is strictly typical in normal and pathologic condition; if forms are made under control, the forces producing them must first be controlled. Only such forms of energy are disengaged and so much of each as are in accord with the design.

2. There is a correlation between all functions under a central power.

3. Only certain substances are absorbed; matter absorbed either benefits or injures the cell; but to a certain degree of irritation the cell retains its integrity.

4. Intellectual and moral qualities of man can not be brought under the law of conservation of energy without acknowledging a metaphysical principle in close contact with matter and energy. *Cogito ergo sum* is the deduction of the general axiom; *species, ergo vivens*. Species creates the individual *in abstracto* and makes it the subject towards objects.

5. We perceive objects not as they are but as they affect our senses; but we get a correct perception over imperfect and faulty apparatus.

6. Only an organism can be sick and may recover health by maintaining the typical form, although chemically changed.

7. Transmission of changes and disorders from parents to offspring means only that species may suffer as well in postposition as in juxtaposition.

8. In nerves and muscles of a dead body, there is no disengagement of electricity and of mechanical force; but an unrestrained chemic dissolution takes place.

Both intellectual and animal life are manifestations of the same metaphysical principle. Type or species leads every disengagement of energy in organic action. But before we consider energy in its relation to matter and especially in its modifications in an organism we must call attention to a misunderstanding commonly met with, that forces act directly at a distance and that energy makes a round from masses to masses.

If it is true that where there is one substance there no other can be and that matter and energy can not be separated; then we may not use expressions as "free or communicated energy;" energy being inherent to matter can be active and disengaged only. Light is communicated neither to the eye nor to the

rock, but disengages energy although differently in the eye and in the rock. Furthermore it must be emphatically said, that disengaged energy is not the real cause of a phenomenon, but that cause is within a thing and only the inciting cause is from without; but disengaging and disengaged energies combined constitute the phenemenon. Simple as these assertions may seem to be, they are essential in our conceptions and their disavowal has led to grave mistakes.

Energy in inanimate masses is disengaged with or without transformation or it is latent. In living organisms we observe the same conditions of disengagement but subject to the biologic laws of maintaining and of developing the type. In most cases disengagement goes on with a partial transformation that means the disengaging energy with that to be disengaged appearing in partly new forms. Warmth affecting wood disengages warmth and, partly, chemic change and light. But if transformation becomes the prominent feature, as in ignited gunpowder, we call disengaged energy adequate. The spark is the adequate energy of burning coal and sulphur and of decomposing saltpetre; warmth disengages chemic change. As a result of this chemic change, we receive substances whose energy is partly used in changing the aggregation of their molecules into gases. Gases disengage mechanical force by expansion. Expansion is mechanical force and is inadequate to the bullet, disengaging its energy without transformation.

But we have to assume a third condition of energy. A spark without gunpowder does not move the bullet; it disengages some warmth in the bullet but does not change its form or place. But as soon as warmth has accumulated to a certain degree, a part of it disappears, changing the aggregation of the molecules only to reappear in its original form when temperature goes below the known limits. This warmth on which aggregation depends has always been called latent, but in a wider sense all energy is in a state of latency if persistent and not disengaging. This must be said of chemic change forming physical bodies; there is a relative rest from which unrest of other energies may be judged. We speak of adequate, inadequate and latent energy only relatively to their prominence.

Comparing the same conditions in living organisms, I must confine myself to a few examples. Much moisture and warmth are required to disengage chemic change in a seed, but once started a metabolic grouping will continue in all substances absorbed by the cell. Light disengages electricity in the eye; light is the adequate energy for the substance in the optic nerve, as sound is for the ear, but neither is light to the ear nor sound to the eye adequate, although both are connected with nerves. But meanwhile a spark may ignite any quantity of gunpowder, and the disengagements in eye or ear are corresponding to intensity and quality of the irritation. To dead organs the same irritations are not adequate any more.

We find, also, inadequate energy active in the organism for absorbed food or poison. Assimilation in its various forms is preëminently such a disengagement; although a mere chemic changing, how manifold are the processes and products! A billiard ball rolls with the very force and in the very direction imparted; two substances put in a vial will surely form the body expected. But what a variety of chemic combinations has been discovered by chemists and all consisting of but a few elements? Every organ furnishes its specific products, mostly beneficial, but sometimes injurious if not changed anew or eliminated. This grand display has caused a wonder at all times, and the fact that substances are produced not found in the physical world has led to the belief in a supervising force of chemic change as the real cause of life. But exposing this fallacy, our authorities restricted themselves to forms and phenomena, excluding all researches relative to essentials of life.

The third state of energy, that of latency, appears in organisms frequently so modified that instead of latency we better speak of energy at disposition. We observe in gland cells, for instance in the pancreas during the state of repose, granules accumulated which we may claim for some reasons not to be protoplasm, but the substance ready for a moment's call of an irritating nerve to be transformed into the specific product of the gland. Corresponding substances in muscles and nerves form the hypothetical stratum for an explanation of their activity. These substances represent energy at disposition.

Of the cosmic influences, or disengaged energies, our senses receive a few, but with a remarkable sensitiveness as to intensity and quality. Others, as electricity, we do not perceive; we feel heat and shock and notice light into which electricity has been converted, but not electricity itself. And light, the source of all life, is not disengaged at all in the human body as long as there is life within. This great restriction in disengaging energy we notice in every living cell in various ways protects life within certain limits and is the cause on one side of restoration after exhaustion and on the other of recovery after sickness. But all restriction ceases when life is extinguished and unrestrained physical laws prevail.

If we are inclined to accept a monistic conception of nature, in that sense that intellectual and animal life have the same origin, I feel satisfied to have shown by this discussion that species is really the principle of life. But to prove it by demonstration, I will proceed to the part of this essay dwelling on sleep.

The simplest living matter consists of protoplasm and an enlivening principle whose lower border line projecting in individuals is reflected in the organs of our senses.

Living matter assimilates, it absorbs substance, merges the material into other chemic groups similar to its own, and eliminates substances not useful to its design; living matter also proliferates, that means it separates and divides masses accumulated by assimilation in new forms like its own with a certain degree of independence.

Groups of cells develop to distinct forms and organs of a specific function as nerves, glands, bones, muscles and so on and these specific functions may become so prominent that assimilation seems to be rather an auxiliary action and that proliferation ceases entirely in certain tissues as in hairs, nails, blood. A mother tissue is necessary for the new formation of such tissue. This process is called metaplasia and is one of the results of differentiation.

Differentiation of tissue as well as of organs causes their independence to yield to a central power with the

result of a more distinct individuality of the organism as a whole. But dependence of tissue and organs, and the more marked individuality of the whole organism make a shifting from variety to a new species difficult and impossible. Virchow says: "Darwinism has no room in pathologic anatomy of man."

Assimilation and proliferation are really the prerogatives in living matters towards inanimate masses as crystals. They are the fundamental functions of life in the simplest forms as well as in the most complicated organisms; they are active in all organs of different and various specific functions which may explain the correlation of these functions and also the dependence of each from the whole. These various and different functions are specific and the result of differentiation as perception, motion, respiration, digestion, circulation and secretion.

All these specific functions have in common the tendency to bring assimilation and proliferation in contact with the outer world, under most favorable conditions, and the means of accomplishing this are the organs.

The external influences are either substance in form of food, drink or air (latent energy in a general sense) or disengaged energy in its origin either directly or indirectly cosmic. Latent energy or food, drink or air entering the body begins a chemic change and means a plus to the household which interchanging gradually diminishes.

There are connective, muscular, glandular and nerve tissues in the human body and each with various metaplastics, and besides this a procreative tissue in the sexual organs. These five mother tissues maintain their character even in metaplastics, but nourishing will be different in mother tissue and metaplastics. Another difference will arise from the specific functions. The glandular cell produces, for instance, trypsinogen, glycogen and so on, the muscular fiber, inogen, both to be disengaged with or without transformation. For muscular tissue it may be an explosion or a process similar to bulging, dividing and separating in proliferation. But for nerves the primordial substance must be produced by their respective cells or mother tissue which on irritation appears instantaneously in an electric nature. For this reason we assume molecules constituting nerve substance to be homogeneous and their electricity to be latent, as warmth is latent in fluids and gases. Therefore their energy is excitable in an instant. Certainly there is not an electric current in nerves. Nerves have lost their individuality as hair, nails and blood have; but their neutrality enables them to be carriers of irritation.

The next conclusion will be that neither nerves nor blood have scientifically the prominence in the household of man that is asserted in our text books. The latter distributes food or latent energy, and the former cosmic irritation or active energy; both maintain a neutrality but of the greatest importance. The fundamental functions of life rest in the mother tissues. The weakness of both the humoral and neuropathology is manifest. Blood and nerves are the routes our therapeutics take, but our attacks must be directed to assimilating and proliferating tissue.

Of the forms of disengaged energy from without, some are received by our senses and are answered by a reaction of electrical polarization. Soon the whole nerve is placed in a state of electric irritation, a "nerve-current" is formed and this irritation is carried to the central organ and from there on other roads back through the whole system especially to muscles, glands and so on.

As we observe in simple organisms, as in hydra, an endoderm absorbing food and an exoderm receiving irritating energy, so we have two systems for the same purpose in higher differentiated organisms.

But organs receiving disengaged energy become exhausted periodically, according to the law of conservation of energy, require rest and are restored by rest. This is the standpoint we have to assume in judging exhaustion leading to sleep.

Herbs and animals fit themselves to the surroundings and protect themselves in order of self-sustenance and development. This tendency is also expressed by differentiation.

Individuation begins with formation of organs, for protection of which in the development of man the greater part is cast off. I mean the fetal membranes. But the remaining part, the skin, serves as a coat of mail and an exit for excretions, and at the same time gives space to peripheral receivers of the organs of perception remotely located. But no other, unless disengaged energy, and only one form and a certain form, finds an entrance at each receiving place; thus light is referred to the eyes, mechanical force to ears and fingers, chemic change to nose and tongue; meanwhile millions of sentinels are dispersed all over the surface, the filaments of cutaneous nerves. For warmth we have no special sense and not for electricity. What a contrast the human skin presents! Impermeable to all substances and influences as long as it is unhurt, the skin is the bearer of apparatus sensible to all grades of quality and intensity of energy from near and far.

Energy of the sun excites electric vibrations of the ether, which, entering the atmosphere, are transformed into light and reach us either directly or reflecting from the surrounding world as color, sound, motion, warmth and so on. These relations to the outer world are the cause of the variation of the body, of its gain intellectually, and of its loss bodily and certainly of our intellectual and moral life.

But on the other side we observe that the functions of the kidneys are more important to health than those of our eyes, and the activity of the stomach and liver more necessary to life than the senses of smell and taste. Indeed we may miss these organs without being aware of the want.

Assimilation and proliferation are good housekeepers, caring less for earning than for managing the earnings. But in earning, expenses are made.

The internal organs, those as well of perception and motion as all specifically active in assimilation in the wide sense, are not simultaneously or equally developed, neither do they reach an equal perfection. Some organs belong to fetal life only, others to a late period in life; the most constant organ is the heart, the first and last in action.

The law of conservation of energy teaches us that we perceive but variations of things and that all phenomena are the result of various forms of the same energy. Only gravitation will not submit to this law, but according to Helmholtz, gravitation or universal pressure is the source of all energies to be considered both in physics and biology.

The quantity of heat necessary to raise the tem-

perature of a kilogramme of water one centigrade is called a unit of heat. Any kind of mechanical work, compression, percussion or friction of bodies produces heat; the mechanical work necessary to produce a unit of heat is the mechanical equivalent of heat. The amount of electricity necessary to produce a unit of heat would be the electrical equivalent of heat.

The mechanical equivalent of heat is known by experiments to be 424, that is a power which would raise a kilogramme of water 424 meters or 424 kilogrammes of water one meter will also raise the temperature of a kilogramme of water one centigrade.

But equivalents are less important for our purpose, because we can not yet consider phenomena of life from a mathematical aspect. If we only know that no energy is lost but that it disappears entirely in one form before it reappears in another, and that the substance after a disengagement is not fit for a disengagement in the same form; then we are enabled to explain how a controlling power may prevent overheating, combustion and decomposition and inducing absorption; how it may lead molecules into certain homogeneous chemic groups, and how these processes influenced from without and repeated a thousand fold in every instant may be carried on here and there in various ways, but uniform and conforming to the whole.

Blood is a metaplastic tissue; we did not observe so far a proliferation of blood cells. The red corpuscles have neither a membrane, nor nucleus and being solid are no cells; their new formation requires a mother tissue. Therefore we can not speak of blood diseases. Blood is a neutral fluid; it may be contaminated as a stream is polluted by surroundings; but it does not contaminate itself. This peculiarity qualifies blood so well as a carrier of food. The chemic interchange is diminished to a minimum on account of its metaplastic nature; oxygen is absorbed by the red corpuscles as charcoal absorbs gases and is carried to all organs and especially to the brain where it is mostly needed; opium and other poisons are transported over this route to distinct cells of the brain where a chemic change may take place with the result of paralysis; the product of the thyroid gland takes the same means of transportation to the brain. At least we can not find any other cause for the degeneration of the brain where the organism is deprived of this gland. Perhaps prohibition of chemic interchange may explain also the germicidal power of blood serum.

Blood heat, although remarkable for its stability and warmth of the whole body seems to be overrated in its importance to the economy. Fever heat indicates only that chemic change is disturbed. Danger arises from this disturbance exclusively.

Chemic interchanging begins in the tissue proper and assumes such complicated and variable appearances that only a few facts can be ascertained. Of food ingested, air, water and solubles enter the organism in a purely osmotic way, but not without an exchange. The exchanged substances loosen chemic groups in the food, without thus rendering them resorbable at stations beyond; this may be repeated, leaving finally waste matter only.

Substances absorbed begin an endless series of metabolic changes. We must assume that these chemic changes are as strictly controlled as production of heat is or any other transformation. Assimilation is mainly chemic change of accumulated masses which slowly decrease to end with elimination of wastings through kidneys, skin and lungs. But we must keep in mind that all processes take place in cells and that their inciting cause, be it from a neighboring cell or a microbe or poison is controlled by physical laws only; biologic control belongs to reaction in the cell exclusively. Every cell acts as a relative individual, prospers and suffers or remains indifferent to irritations of neighbors. But to remain indifferent means in biology to be protected; protection is within certain limits towards normal and pathologic irritation. At times the constitution of the plasm is weakened, some chemic groups can be loosened easier, or certain substances in the blood have a peculiar influence on distinct groups. For this reason they are termed poisons or medicines; then the reaction in the plasm becomes abnormal and the inciting cause with the reaction in the cell results in a condition which we call sickness or disease.

In general, we construct the law of conservation of energy as follows: In nearly every disengagement there is transformation present; disengaging energy of higher intensity disengages so much more energy of another form, and in the contrary absorbs so much that the functions of the quantities before and after the disengagement are not altered; both energies before the disengagement are equal to the energy afterward in the new form. Practically we say, what is loss to one organ is gain to another. We can at least understand that there is not so much loss of substance on account of assimilation, but that metaplastic tissue being practically eliminated from the economy, and although of greater stability, increases consumption and wasting in the mother tissue.

It becomes now our duty to demonstrate consumption and wasting in the nervous system. As blood is the carrier of food to assimilating and proliferating tissues, especially qualified by its metaplastic nature and a neutral distributor of food to all organs, so cosmic influences affecting our senses as color, sound, motion, pressure and so on, are transferred by carriers equally neutral, the nerves. We assume a metaplastic origin for the nerves, too, because they grow from the nerve center and are new formed from there. And as blood is transported to a central station to be distributed from there to all districts, so all irritation by disengaged energy from without is sent through sensory nerves to the brain, to be followed by orders to muscles, glands and so on.

There are vital railways and telegraphs in the organism. But there is still another conformity, in the receiving stations. Teeth, saliva, gastric juice and others act upon food, and adapt it for absorption, but the apparatus of our senses does the same with irritation of cosmic influences. Light does not affect directly the optic nerve, nor does sound irritate the nerve of hearing, and certainly the nerves of smell and taste may not be incited unless a receiving apparatus has selected carefully the form and quality of disengaged energy and has adapted it to the respective nerve. How would it be possible that nose and tongue can discriminate, when chemist and microscopist have already reached the limits of their skill! How light, sound and odors are delivered to sensory nerves we do not know. The veil is partly raised from the finer structures of retina and labyrinth, but we do not understand the wonderful pictures.

Is visual purple analogous to gastric juice in transforming light into electric irritability? We know the nerve to be a good carrier of irritation on account of its metaplastic nature, but we only presume the form of its disengaged energy to be of the electrical kind, a polarization, termed "nerve current" but not an electric current. I have to repeat yet with emphasis, that blood and nerve have a great stability of their own and that they can not become sick; their normal and abnormal conditions depend entirely upon their respective mother tissue and the surroundings, just as hair and nails do not contract a malady but suffer with the disordered mother tissue.

Nerve irritation is conveyed to the nerve cell to reappear there in a new transformation. But we have to attribute two metaplastic processes to the nerve cell; one as we have seen in the formation of nerve substance and the other in the production of little corpuscles similar to trypsinogen and glycogen which, on nerve irritation, appear as the specific products of the cerebral cells. Their existence is not yet proved by direct observation, but is highly probable according to conclusion by analogy. Every irritation must leave a permanent impression on the products of the cerebral cells; these imprints affecting mind are repeatedly tested, selected, arranged and preserved. Whether the same nerve cell produces nerve substances and these corpuscles, and how the processes in cells and filaments are carried on we do not know.

But we may understand somewhat of the magnitude and diversity of their work when we are informed that the brain contains 600,000,000 of nerve cells and twice and thrice as many filaments connecting them, and if we join anatomy with physiologic activity we take into consideration that many irritations are required for the conception of light, and many more to get the idea of green, of shape, of leaf, of growth and of life, and that the endless series of irritations must be tested, selected, arranged and preserved. These imprints must be regarded as eliminated from the economy becase they are metaplastics. We are aware now of the great consumption and loss resulting from their production. Exhaustion is the natural consequence; but nerve cells do not differ in this from other mother tissue. The difference rests in their restoration only.

Nerve irritation is adequate energy to the corpuscles produced by the cell, but not to the plasm maintaining the same. Repeated irritation and over-exertion produce hyperemia and swelling connective tissue, but no impressions in the exhausted cell. Its specific activity ceases.

The exhausted cell is not specifically active, as the nail does not grow in case of fracture of the limb because the connective tissue (in a general sense) is engaged in producing a callus. But there are other factors checking activity of the brain cell, also, as impaired constitution of the plasm, interruption of nerve irritation, poison, shock, hypnosis. The cell in normal condition may be exhausted, but its integrity is not impaired. If there are different influences having the same effect, there must be another cause of sleep which is common to all and different from each. Sleeplessness during nervous excitement, and in neurasthenics, dreams and so on, indicate that periodical exhaustion does not more than induce sleep.

Many animals go well fed into a winter sleep. Certain fishes and amphibia sleep in a similar way during the dry season. Dr. Fred Cook, of the Peary expedition, reports that Eskimos are in a semi-comatose condition during the night of several months, that menstruation ceases, that all births are counted from the time of the reappearing sun and that nevertheless they sleep every twelve hours although not exhausted. The temperature of their blood is half a degree higher than ours. And then we know that quietness, darkness and coolness have much to do with sound sleep. All these facts convince us that exhaustion in the cell induces sleep, but that the cell, self-ruling, demands sleep and it puts itself asleep. Sleep is really to be compared with other resources of nature maintaining welfare and life; as hypertrophy, vicarious functions of skin, lungs and kidneys, the changing fur in winter and so on. Muscles hypertrophy in official duty and their action is *en masse*, but nerve cells, active individuals, find relief only in periodical rest.

Pflueger maintained the theory that brain cells are very sensitive to want of oxygen and that this want is the cause of sleep. This theoretical conception is in contradiction with many facts, and it will be necessary to go into details to reach a proper understanding. The plasm of cerebral cells is probably not more sensitive to a want of oxygen than in other cells, but this want seems to be felt mostly at the disengagement in their products forming "imprints."

The condition of the blood has much to do with our mental activity and, on the other side, hard brain-work influences the quality of the blood.

Full blooded youth is intellectually fresher and needs more sleep than the dry stupid senile. He who sleeps dines. Methodical reasoning is less tiresome; clear thinkers as Lessing, do not dream; all such assertions connect with the idea that supply and consumption of blood are in a causative relation to our capability of perceiving and reasoning. But if our thinking should depend on the supply of oxygen exclusively, then the full blooded would be our philosphers and the pale and lean would pass in sleeping the time for action. In fact, Pflueger asserts only, that sound and plentiful blood and especially its oxygen nourishes the cerebral cells. But if we say, these cells feel a want of oxygen not in their sustenance but in their specific action, then all contradictions mentioned above are dissolved and this theory is placed in the right light excepting in one point. We have to place the cause of all vital phenomena in the cells, specifically active.

For this reason we adopt the following explanation of sleep: nerve irritation is followed by reaction in the cell with the result of granules, already separated, being transformed into the specific products; oxygen of the blood is required for this transformation and enters into this chemic change. Nerve irritation fixes the amount of oxygen and partly the quality of grouping. If the plasm be exhausted or the impressions too weak, then the product will be deficient and the imprints are either indistinct, unfit, or they are missing. A correct perception requires a well fed cell, a vigorous irritation and oxygen at disposition.

Besides removing some absurdities of the storing-up theory, our conception explains the objectivity that is in every perception. The impression of light is reaction of the cell and is subjective, but the perception of blue is an alteration due to the exciting cause and is objective. We comprehend also the

truth in the proverb, "he who sleeps dines." We also understand that full blooded youth demands more sleep than old age, and we find it correct that clear thinkers mature their thoughts and close up periodically to begin anew later. The cause of sleep rests in the cell; it puts itself asleep whether there be oxygen or not. Want of oxygen is not in nearer causation to sleep than want of irritation in repose, darkness and monotony.

We must bear in mind that every organ has a two fold function; one in its official capacity towards the organism and one in its private capacity for self-sustenance. We observe both functions increasing and decreasing in glands and muscles, not bound to periods; in others as in the heart and in the lungs there is work and self-preservation well compensating each other and consequently uninterrupted. But brain cells have only one resource of restoration and one way of caring for their welfare viz., periodical rest.

It is apparent now that we can not speak of sleep in the fetal brain, because it is active scarcely in any other way but in differentiating and in developing.

Want of oxygen being the cause of sleep is an easy formula of a mechanical conception of nature, but it is also a fair example of the shortcoming of such a conception. I refer to cases of total blindness and deafness as of Laura D. Bridgman, where the sense of touch was the only means of developing a bright intellect of wide range. If the human organism were a machine only, how could it be possible that intellectual powers could be unfolded in such a high degree when all avenues of communication with the outer world seem to be closed?

There is a miniature world within the human body that seeks a union with the greater world, and the organs of perception and motion are the means and ways to accomplish this. They are really the servants and if one fails another will be tried.

A result of the inactivity of the brain cell is unconsciousness in one direction and idleness of nerves and muscles in the other as a matter of fact. Yet all organs show a slower and weaker activity during sleep, but can we expect anything else from decreased or missing irritation?

Whether muscles sleep, may be decided by a few words. Muscles are real dynamos which mostly on nerve irritation transform chemic change into mechanical force; they are more or less in a constant tonus. Some muscles become exhausted and rest occasionally; thus they take a chance during sleep. Some others are never in a state of repose. But none, even if it should be in action now and then only, is, when exhausted, the cause of unconsciousness. Most of the muscles may rest but they do not sleep. Even nerve irritation is not necessary for all muscles. The heart contracts without any palpable excitation from without (confer Romberg, Berlin, *Klin. Woch.*, March 27, 1893, and JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, vol. XXII, No. 17). Sympathetic and pneumogastric nerves regulate only the heart's action.

About both motor and sensory nerves and their peripheral apparatus not much remains to be said. They are telegraph wires and apparatus; there is an equal loss in their wear and tear, whether in use or not, and consequently no periodical exhaustion.

The aim of viewing nearly the whole field of physiology from a higher standpoint is to give it a wider scope and to bring abstraction again nearer to reality. The great gain that will be derived is that we will understand better the merits of functions and the value of symptoms; we learn weighing them.

If we are in doubt whether we should resort to intubation or tracheotomy, or to expectant treatment, the question arises, What is the worse, weakness of the heart, or want of air? Then we weigh symptoms; and to weigh them, constitution and vitality is practically more important than a detailed diagnosis.

ORIGINAL INVESTIGATIONS ON THE NATURAL HISTORY, (SYMPTOMS AND PATHOLOGY) OF YELLOW FEVER. 1854–1894.

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NEW ORLEANS, LA.

(*Continued from page 439.*)

CHAPTER VII.

Lungs: The lungs in the dependent portions were greatly congested with blood, and presented a mottled purplish and red appearance. The lower portions of the lungs, when cut, resembled the congested lungs of pneumonia, and in circumscribed portions effusions of blood had taken place.

The muscular structures of the thorax, when cut and exposed to the atmosphere, presented a brilliant scarlet hue, like those of patients poisoned with cyanid of potassium.

Abdominal cavity: Alimentary canal, exterior surface of stomach somewhat congested. Internal mucous membrane of a deep purplish and brownish-purple and red color, with variations in the depth of the color, presenting a mottled appearance. Under low magnifying powers, suitable for the examination of the mucous membrane of the stomach by direct light, an intense congestion of the capillaries and small blood vessels was observed.

In some places the epithelium of the mucous membrane of the stomach had been removed, and the capillaries were exposed and ruptured, and from the points of rupture issued small flakes or coagula of blood, resembling those so frequently found in black vomit. The epithelial cells of the mucous membrane were detached in large numbers; they could also be removed readily by slight and delicate scraping with a spatula.

Black vomit: The stomach contained one pint of black vomit, of a dark purplish color, resembling in all respects defibrinated and altered blood. Under the microscope, the black vomit was found to contain numerous colored blood corpuscles, variously altered, also cells from the mucous membrane of the stomach, and also broken capillaries. In this case the black vomit resembled in all respects blood which had been defibrinated and mixed with gastric juice, or with a mucoid fluid. This specimen of black vomit, taken from the stomach twelve hours after death, contained some fibers, and the sporules and thallus of a plant resembling the yeast plant. The yeast plant appears to be most abundant in the acid black vomit of life, and appears to be dependent in large measure for its rapid development upon the articles of food consumed. If much sugar be introduced into the stomach with the food, the growth of this plant is rapid in a stomach which has lost its muscular and diges-

tive power to a great extent. The sporules of these plants appear to be ever present in the atmosphere, and they increase rapidly whenever the proper conditions, as in the disabled stomach of yellow fever with its albuminous contents, exist for their growth and development. The odor of this specimen of black vomit was putrid and disgusting, resembling that of decomposing blood. When heated upon the sand-bath the odor emitted was very disgusting and overpowering, and excited nausea. Specific gravity of black vomit 1026. Reaction of black vomit alkalin. The surface of the mucous membrane of the stomach, as well as the black vomit itself, emitted strong fumes of ammonia, in the form of free ammonia, and its carbonate and sulphid. When a glass rod was dipped in strong hydrochloric acid and held over the mucous membrane of the stomach and over the black vomit, heavy dense fumes of chlorid of ammonium were evolved. The alkalin character of the black vomit was evidently due to the decomposition of the urea, and its elimination as carbonate of ammonia by the gastric mucous membrane. The black vomit was carefully tested for urea, and yielded this substance in considerable amount, as well as ammonia and its carbonate and sulphid.

Analysis of black vomit: Reaction alkalin; alkalin reaction dependent upon ammonia; emits heavy fumes of chlorid of ammonium in the presence of hydrochloric acid; specific gravity of black vomit 1026.

One thousand parts of black vomit contain:

Water.				906.00
Solid residue, 94.00	Organic matters, 85.40	Albumin, colored blood corpuscles, mucous corpuscles and epithelial cells, 77.14	Organic matters.	75.46
			Saline matters	1.68
	Saline matters, 8.60	Extractive matters, urea, ammonia, etc., 16.86.	Urea, ammonia and fatty matters	9.94
			Saline matters	6.92

Still further to confirm the existence of blood in the black vomit, the ash derived from careful incineration was tested for iron, and was found to contain this substance in amount equal to that which would be found in 77 grains of blood.

Microscopic and chemic examination of blood from cavities of the heart: The blood from the cavities of the heart contained several loose, golden-colored fibrinous concretions. The blood was fluid and did not coagulate upon standing. The odor of the blood twelve hours after death was putrid, but not so disagreeable as the black vomit taken from the stomach after death. The colored blood corpuscles were crenated and altered in form in some instances; many of the corpuscles, however presented the usual appearance, while others were more round and smaller than in health. The blood from the cavities of the heart and from the large blood vessels contained numerous fibers. In twelve hours after death the blood manifested even within the heart itself the presence of living vibrating animalcules. Upon standing, these increased in numbers. They were also, as we have just seen, present in the black vomit of the stomach. The fibers must have been formed or originated in the following ways:

1. They existed in the blood before death, being received through the pulmonary apparatus. We can not adopt this view, because they are entirely absent from the fresh blood examined during the life of the patient.

2. They arose spontaneously in the blood after death, as a result of the putrefactive process. The adoption of this view would involve the adoption of the theory of spontaneous generation, which, as far as our investigations have extended is, in the present state of our knowledge untenable.

3. They penetrated from the stomach into the blood, finding ample space for entrance through the broken capillaries and through the eroded surface of the gastric mucous membrane.

The germs of the fibers existed in the tissues during life, and even in a state of profound health. They were prevented from germinating by the chemic changes (compositions and decompositions) characteristic of health. After death they multiplied rapidly and found a ready entrance from the tissues into the blood vessel system through the pores of the capillaries and small veins, described by Conheim. These so-called stomata vary in size from 1-1000 to 1-10,000 of an inch in diameter; and if it be true that there are really openings or pores in the small veins, we have an explanation of the mode in which the minute vibrios might readily find entrance into the blood from the surrounding tissues. The surface of the blood from the heart presented an oily appearance, and the microscope showed the presence of minute globules. When a drop of the blood was allowed to fall upon a piece of white filtering paper, the center presented a bright red appearance from the presence of the colored corpuscles, while the central colored spot was surrounded by a bright red golden colored border.

The reaction of the blood from the cavities of the heart was acid.

Chemic analysis of the blood revealed similar results to those obtained during life; thus, the colored blood corpuscles were normal in amount; fibrin greatly diminished, and in fact entirely absent; bile and urea present in large amount. The fact that the fibrin was diminished even in the acid blood would establish the important fact that the diminution of this element in the yellow fever blood was real and not apparent, and dependent merely upon the presence of ammonia. The acid reaction of the blood appeared to have been the result of post-mortem change and may have been induced by the vibrios. The acid reaction may also have depended to a certain extent upon the relation of phosphoric and sulphuric acid and acid phosphates in the blood, in consequence of the arrest of the action of the kidneys. The brilliant scarlet color of the blood upon exposure to the atmosphere, and of the muscles of the thorax without such exposure, may be due to the presence of urea and phosphoric acid and acid phosphates, the accumulation of which in the blood was dependent upon the arrest of the function of the kidneys. To the same cause, that is the cessation of the action of the kidneys, must be referred the remarkable bloodiness of the tissues; the watery element of the blood is not properly removed by these organs and the blood vessels become in consequence, filled and distended with the altered blood. The passive hemorrhages observed in the various organs, stomach, lungs and even in the muscular structures, must be referred to the destruction of the fibrin of the blood and to the great destruction of the blood in virtue of the cessation of the action of the kidneys, liver and stomach. It results also from the same causes, viz.: The fluid character of the blood and the great distention of the blood vessel system with an abnormal amount of altered blood, so that when a canula is plunged into

and through the walls of the heart of a yellow fever subject, even hours after death, the blood will flow in a continuous stream through the canula, and some pints may thus be drawn off.

Spleen: Somewhat enlarged and softened. Weight ten ounces. Splenic pulp and structures changed readily and rapidly to the arterial hue when exposed to the oxygen of the atmosphere. Under the microscope, the splenic pulp was found to consist of altered red corpuscles, granular masses and numerous oil globules. The decoction of the spleen presented a brownish, purplish, reddish, mahogany hue, quite different from the golden hue of the decoction of the heart and liver. Upon chemic analysis the spleen contained both bile and urea.

Liver: The liver presented a yellow and brownish-yellow appearance. The portal system of capillaries appeared to be congested with blood. A few small slate-colored spots were observed upon its surface. The structures of the liver were firm and appeared to be firmer than in health; considerable force was required in mashing the structures in the wedgewood mortar previous to analysis. Upon analysis the liver yielded animal starch, grape sugar, urea in considerable amount. The decoction of the liver yielded urea to a less amount than the decoction of the brain. Under the microscope, the liver was found to be loaded with oil globules, and many of the cells were greatly distended with yellow oil. The oil globules were also deposited within the meshes of the fibrous tissue of the liver. Owing to the large amount of oil present within and around the liver cells, they were indistinct in their outlines. The accumulation of oil in the liver was undoubted. The color of the liver, especially upon the cut surface, was that characteristic of yellow fever, and its consistence was as usual, also as is usual in this disease, increased. It would appear that albuminoid or fibroid granular matter transudes through the blood vessels of the liver, as through those of the kidney. It is probable that the peculiar alterations of the liver in yellow fever, cause obstruction to the free flow of blood through its hepatic and portal veins and capillaries, and in such obstruction we may find some explanation of the congested portal circulation, and even of the gastro-intestinal hemorrhage, or at least a favorable condition to its establishment.

Bile: Specific gravity of the bile from the gall bladder, 1040. The bile presented a dirty, greenish-yellow hue, was thick and grumous, and under the microscope was found to contain numerous cells of the mucous membrane of the gall bladder. Mucous membrane of gall bladder deeply congested, and at the same time discolored by bile. When viewed in mass the bile presented a greenish-black color. It was highly concentrated; a few drops being sufficient to color of a golden color half a gallon or more of water. As is usual in yellow fever, the amount of bile in the gall bladder was small, only 120 grains being obtained. This diminution of bile appears to be characteristic of yellow fever; the gall bladder as a general rule is small and contracted, and contains a small amount of bile, rarely exceeding 150 grains, and rarely not reaching 90 grains in intermittent, remittent, pernicious and malarial hemorrhagic fever, and in typhoid fever, on the other hand, the bile is more abundant; and as a general rule the gall bladder after death is distended with bile. In yellow fever, bile is also absent from the intestinal canal, and it would appear from these facts, as well as from the jaundice of yellow fever, that in this disease there is an occlusion of the hepatic ducts, in a manner similar to the occlusion of the excretory ducts of the kidneys.

Result of chemic examination of bile: Specific gravity of bile, 1040. The specific gravity of the bile was above that of the serum. Did not coagulate by heat. The proper reagents failed in producing any crystalline constituents.

Solid residue in 120 grains of bile:

The whole amount contained in the contracted gall bladder					grains 15.66
Solid residue in	100	parts	of	bile	13.05
" "	1000	"	"	"	130.50
Water	1000	"	"	"	869.50

Kidneys: Weight of kidneys, ten ounces. Kidneys congested on the exterior, more especially in the cortical portion, but of a more decided yellow color than in the kidneys of health. When sections were made the kidneys presented a yellowish color, resembling kidneys undergoing fatty degeneration. The kidneys, with the exception of a few circumscribed, small slate-colored spots upon the exterior, presented an appearance and color similar to that of the heart and liver. Under the microscope, the excretory cells and tubuli uriniferi of the kidney were found to be loaded with oil globules and granular, fibroid and albuminoid matter. The oil globules were diffused throughout the excretory cells, tubuli uriniferi, Malpighian corpuscles and fibrous textures of the kidney. The arrest of the urinary excretion, appeared, after prolonged and careful microscopic examination of sections of the kidney, with Valentin's knife, to have been due to the filling up of the Malpighian corpuscles and tubuli uriniferi and excretory cells with oil globules and granular, albuminoid or fibroid matter; and also to the stagnation and conglomeration of the colored blood corpuscles in the delicate capillaries of the kidney. The capillaries of the kidneys were filled with colored blood corpuscles.

The bladder contained no urine, and it was evident that the patient had not excreted any urine during the last forty-eight hours of life, and many of the symptoms during life were without doubt due to the arrest of the urinary secretion.

We have thus presented the results of the laborious and careful investigation of this case, which required my undivided attention for the entire period in which it was under observation, to the exclusion of all other business or interruption, with the exception of a few hours devoted to sleep and meals, not exceeding seven hours out of the twenty-four, each day, the remaining seventeen being devoted to the investigation; in order that a true picture might be presented of the relations of the changes of the blood to those of the various organs. Each case studied in this manner becomes a living exponent and demonstration of the nature of the disease, just as the description of one animal will to a great extent serve as the accurate description of the entire species to which it belongs.

Case 2.—Charles Collingberg; native of Iowa; attacked with yellow fever July 30, 1871; died in Charity Hospital after the supervention of black vomit August 4. Came to New Orleans four weeks previously; occupation, flat-boatman. Supposed to have contracted the fever on the bark *Mary Pratt*, from Cienfuegos, which had arrived a short time before with sugar. Is said to have slept for four nights previous to his attack upon the *Mary Pratt*.

According to official reports, this was the first case of yellow fever which occurred in this city during the

summer of 1871. Although the number of cases of yellow fever which occurred in the summer and fall of 1871 was small, yet the disease appeared to be of a violent and fatal nature; thus up to October 6, out of thirty-seven cases, which occurred during the preceding sixty-nine days, sixteen terminated fatally, thus giving a mortality of 43.2 per cent.; and the active and fatal character of the disease was still further manifest in its comparatively short duration; thus of these sixteen fatal cases, one terminated on the third day; one on the fourth; two on the fifth; five on the sixth; four on the seventh; one on the eighth; one on the ninth, and one on the sixteenth day.

According to the official reports of the Board of Health, 114 well marked cases of yellow fever occurred from the date of the first case, July 30, to that of the last, December 18, and of this number fifty-five terminated fatally; that is the mortality reached the extraordinary figure of one death in 2.07 cases, or 48.24 per cent.

In the case now under consideration, (Geo C. Collingberg) the blood from the cavities of the heart, as well as the black vomit, and the structures of the heart, liver and kidneys were subjected to careful microscopic examination, a few hours after death. The blood from the heart presented the characteristic golden colored areola, when dropped upon bibulous paper, and under the microscope the colored blood corpuscles presented a crenated and stellate appearance. No animalculæ or sporules, or vegetable organisms were observed, even under the highest powers of the microscope. Numerous vibrios were observed in the black vomit taken from the stomach after death. The muscular structures of the heart presented a pale, yellowish-brown, flabby appearance and contained much free oil in the form of globules. The liver presented the characteristic yellow color, and contained much oil, deposited in the form of oil globules in and around the secretory cells of this organ. The kidneys presented a yellowish-brown color, and the excretory tubes were filled with yellow granular matter. I injected, by means of a syringe, (the nozzle of which was plunged through the skin) into the cellular tissue of an active dog both black vomit from the stomach and fluid blood from the cavities of the heart, and also applied the black vomit to the mucous membrane of the eyes. The animal also swallowed a portion of black vomit and blood, after fasting. No ill effects were observed and the animal remained apparently well and active.

In the case of Newton Simpson, who was attacked on Oct. 11, 1871, and died with urinary suppression and profuse black vomit, on the ninth day of the disease, the textures of the body, divided by the knife, presented the bloody appearance usual in such cases of yellow fever; urea was detected in the blood, brain and liver. The heart contained in all its cavities dark fluid blood, which gave an acid reaction at the time of the post-mortem examination, ten hours after death. Under the microscope, many of the blood corpuscles presented a crenated, wrinkled appearance, others were swollen, while others again presented the usual appearance.

I could after careful examination, with high powers, detach no animalculæ, or simple vegetable or animal forms, although the search was conducted with great care, with powers of various degrees, from one-fourth to one-eighteenth of an inch objectives, and the highest oculars. The blood was fluid, with little or no fibrin, and no fibrinous clots; the fibrin was in so small an amount, and in such a soft and unstable condition that it was impossible to determine the quantity. Specific gravity of blood 1046.

1,000 parts of blood from the cavities of the heart contained:

Water	852.70
Solid residue	147.30
Fibrin	Traces.
Saline constituents	9.80

From experiments which I have conducted, it appears that the specific gravity of the blood in the cavities of the heart after death from yellow fever is less than that contained in the large blood vessels. This appears to be due to the fact that the heart continues to circulate the blood, or to force it through its cavities during the last moments of life, the red blood corpuscles are arrested in the capillaries, and only the more tenacious constituents of the blood are returned to its cavities during the last moments of life. In this case, the spleen was somewhat enlarged and softened, and its "pulp" consisted of numerous colored corpuscles, oil globules and granular masses; but no living animalculæ or vegetable forms were observed. Blood corpuscles of spleen not specially altered in appearance. Oil globules abundant in spleen.

The reaction of the blood from the liver was acid, and at the end of twenty-four hours numerous prismatic crystals, of the triple phosphate of lime, magnesia and ammonia formed in the fluid oozing from the cut surface of the liver. The blood of the liver contained numerous oil globules, but no specific animalculæ or vegetable organisms.

The results of the microscopic examinations of the structures of the heart, liver and kidneys were similar to those detailed in the report of the case of John Allen.

In the case of Jacob Siegarist, age 26, native of Germany, who was attacked Oct. 12, 1871, and who suffered with well marked yellow fever, characterized by suppression of urine and alkalin black vomit, and who died on the seventeenth day of the disease, urea and bile were found in the blood and in all the organs, brain, liver, spleen and heart. At the necropsy, performed three hours after death, both cavities of the heart contained warm fluid blood, which gave a slight acid reaction to litmus blue paper and upon standing coagulated, forming a soft gelatinous clot which possessed no contractile power. The aorta, vena cava and pulmonary veins in like manner contained warm fluid blood, which coagulated imperfectly upon standing.

(*To be continued.*)

APPENDICITIS.

DEDUCTIONS FROM TWO HUNDRED AND SEVEN CASES OPERATED ON, WITH TABULATED REPORT.

Read before the Chicago Pathological Society, Dec. 10, 1894.

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(*Continued from page 437.*)

I will endeavor to give a short outline of the various conditions found in operating for appendicitis:

1. Where the abdominal wall is infiltrated, and the abscess is opened without opening the unaffected portion of the peritoneum, there may be: *a*, a small circumscribed abscess with the appendix forming part of the wall; *b*, a small abscess with a tract leading to a larger abscess deeper; *c* a large abscess filling the iliac fossa, containing fecal concretions, or a gangrenous appendix floating in pus, all closed in with firm adhesions. (This condition never exists in the early stage, and in this class of cases the adhesions protecting the peritoneum should not be broken to remove the appendix); *d*, there may be multiple abscesses with no connecting sinuses. This is a comparatively rare condition. In one of my cases, a second abscess was not opened and the patient died of pyemia four weeks later; *e*, there may be an abscess in the opposite side of the abdomen; it usually appears in the same relative position to the left anterior superior spinous process as the abscess does to the right. There is no connecting sinus. It never occurs in early cases, and is more commonly found a week after operation and three or four weeks after the onset of attack, and should be opened and drained.

2. In another class of cases, where the peritoneum is opened and no adhesions to the anterior abdominal wall found, a circumscribed abscess may be found situated on the posterior wall of the abdomen, over the promontory of sacrum and the appendix and pus surrounded and walled in by adherent omentum and intestine. This is the most common condition found in the early stage. The location of the abscess may be near the median line, near the margin of the pelvis, close to the crest of the ileum, over the kidney, posterior to the cecum, or on the margin of the liver, as in two cases. The occurrence of a suppurating appendix on the surface of the liver or adherent to its margin is due to the congenital deformity and malposition of the cecum, so perfectly described by Cushman, and the distension of the colon with gas does not aid in making a differential diagnosis between appendicitis and cholecystitis. Still the most frequent location for the appendix is in the neighborhood of the McBurney point. The exact position of the appendix can be found by following the white fibrous bands along the convex surface of the cecum to the base of the appendix. In all of these cases the field of operation should be thoroughly protected by carefully packing with strands of iodoform gauze, retaining the ends outside. The adhesions are separated, the pus sponged out and the appendix liberated from its adhesions; a ligature is then placed on the appendix, and one on its mesentery. In all the cases where the peritoneal cavity is opened directly, the appendix should be removed. Where the appendix is situated above and behind the cecum, in close proximity to the liver, the induration can be detected behind the cecum, and must be reached by pressing the cecum forward, packing around and opening the abscess, locating the appendix and removing it.

3. Where the abscess is circumscribed in the pelvis, and the appendix is found hanging over the brim or attached to the uterus, tubes or ovaries, the appendix is located by following the bands on the cecum; pus sponged out, appendix amputated and a long glass drain inserted.

4. In another class of cases the peritoneal cavity will be found to contain a large quantity of free pus with no limiting adhesions, the bowel may be smooth and glossy, not in the least congested or eroded of its endothelium. All of these cases recover. On the other hand, the bowel may have a livid blistered appearance, entirely excoriated of its endothelium, and very much distended, showing a paralysis of its muscular wall. The great majority of these cases die. In either of the above cases, the appendix may be adherent or free; it is usually perforated and gangrenous. In both, the appendix is located by the fibrous bands on the cecum or by the sensation to the touch by its swollen, hard and enlarged condition; it must not be confounded with the indurated omentum. Extensive drainage, both of glass and gauze, should be employed, and no irrigation.

5. We find a class of cases when there is a small quantity of pus located around the appendix, with partial adhesions protecting the peritoneum and with flakes of lymph extending some distance. This condition may be caused by a perforation of the appendix; by a gangrene of the mucous membrane, local or general, without perforation; by a simple ulcer of appendix without perforation; by accumulation and retention of muco-purulent material in the appendix, with only an abrasion of the mucous membrane of that organ.

6. Specific ulcers in the appendix without perforation or infection of peritoneum, as: *a*, tubercular, of which we had one case with recovery; *b*, typhoid, three cases, all recovered. Both of the latter conditions produce all of the acute symptoms, pain, vomiting, tympanites and elevation of temperature. But with the typhoid, prodromal symptoms and marked elevation of temperature exist *before* the pain, nausea and vomiting. In these cases when the appendix is located at the time of operation it will be found very much enlarged at seat of ulceration, with the distal end distended with accumulations.

7. A class of cases when the canal of the appendix is partially or completely obliterated, or a stenosis of the canal is produced sufficient to cause retention of material in distal end, causing recurrent attacks. In one of the cases of this kind there was a fecal stone entirely surrounded by connective tissue, the mucous membrane having been completely destroyed and the canal obliterated in a previous attack; there were no adhesions around the appendix. In many other cases portions of the canal were found obliterated and in others a stenosis or narrowing of the canal; the latter is the most annoying variety, as there are frequent recurrences of attacks, and the patient is rarely ever free from pain or sensitiveness in that region. As far as I can learn from the literature, the credit belongs to Dr. Henry O. Marcy, of Boston, for being the first to perform the operation of appendicisectomy in the intermediate stage for the relief of this class of cases. The operation was on Dr. Samuel B. Nelson, Nov. 9, 1886, and the report was published in the Boston *Medical and Surgical Journal* at that time. The patient recovered and left the hospital in eighteen days.

8. Appendicitis stercoralis: In this class of cases there is a large accumulation of feces surrounded by mucus or muco-purulent secretion. The attacks of pain are severe and recur frequently. They are usually accompanied by a temperature not exceeding 100 or 100.5 degrees, and vomiting is a very pronounced symptom. The attack resembles one of intestinal retention, as frequently a movement of the bowels can not be produced for four or five days. The cause of the symptoms of intestinal obstruction has not been

Number of case.	Date of operation.	Name of patient.	Operator.	Male.	Female.	Number of attacks before operation.	Age of patient.	Ulcerative appendicitis.	Gangrene of appendix.	Perforation of appendix.	Tuberculosis of appendix.	Appendix *non*-adherent.	Appendix adherent.	Appendix gangrenous and detached.	Foreign body.	Enterolith.	Time of operation after attack; days.	Recurrence after simple drainage.	Rupture of abscess into urinary bladder.	Circumscribed abscess; peritoneal cavity shut off.	Acute diffuse peritoneal; peritoneal cavity opened.	Septic peritonitis without limiting or with incomplete limiting adhesions.	General septic peritonitis with no defined seat.	General septic peritonitis with incomplete adhesions.	Rupture of circumscribed abscess into peritoneal cavity.	Secondary fecal abscess into a different part of abdominal cavity.	Appendicsectomy during attack.	Appendicsectomy between attacks.	Fecal fistula.	Fatal sapremia.	Pyæmia.
146	18-5-94	J. T.	M.	1		3	50						1				10														
147	24-5-94	C. C.	"	1		3	36										11			1											
148	26-5-94	Mrs. T.	"		1		28	1	1	1							11				1		1				1		1		
149	28-5-94	L.	"	1			36										9			1											
150	28-5-94	L. W. P.	"	1			41	1									20 h										1				
151	1-6-94	O. H.	"	1			24			1			1				5			1							1				
152	4-6-94	A. M.	"		1	5	27		1	1			1				3			1							1				
153	10-6-94	N.	"	1			40		1	1			1			1	4			1	1			1			1				
154	6-7-94	W.	"	1			50		1	1			1				4						1				1		1		
155	6-7-94	A. L.	"	1			26						1				14											1			
156	8-7-94	O.	"	1			45										8			1											
157	9-7-94	G.	"	1			22										4			1			1								
158	19-7-94	L. G.	"	1			16		1				1				9			1							1				
159	21-7-94	T.	"	1		1	19						1				3	1			1										
160	24-7-94	G. G.	"	1			18		1	1			1			1	4							1			1				
161	25-7-94	C.	"	1			28		1	1			1				7			1							1				
162	6-8-94	S.	"		1		16	1				1					2										1				
163	7-8-94	McG.	"		1	2	42																					1			
164	17-8-94	R.	"	1			50													1									1		
165	24-8-94	A. S.	"	1		5	22						1			1												1			
166	4-9-94	M. D.	"		1		6		1				1			1	4			1							1				
167	4-9-94	J. C. K.	"	1			35										10			1											
168	5-9-94	W. B.	"	1		2	14		1	1		1				1	5						1				1				
169	9-9-94	A. J.	"	1			20		1	1							6							1	1		1				
170	9-9-94	F.	"	1			19		1	1		1				1	33 h						1				1				
171	11-9-94	B.	"		1		11						1			1	7			1											
172	13-9-94	M.	"		1		14										10			1					1						
173	22-9-94	D. D.	"	1		11							1					1													
174	22-9-94	A. E.	"	1			28										5														
175	26-9-94	G. T. H.	"	1		1	24										6			1							1				
176	27-9-94	A. H.	"	1			8		1	1			1			1	4			1							1				
177	14-10-94	J. C.	"	1			18										9														
178	16-10-94	C. E.	"	1		1	37			1			1				21		1									1				
179	21-10-94	B. P.	"		1	12	21	1			1						36 h					1	1		1						
180	23-10-94	B. P.	"	1		1	27		1	2			1			3	9			1							1				
181	30-10-94	M. P.	"		1	10	16		1	2			1							1							1				
182	6-11-94	R. A.	"	1		7	24		1				1				15 h										1				
183	8-11-94	C. B.	"	1			31		1				1				5			1						1		1			
184	10-11-94	M. T.	"		1		16	1	1	1			1				18 h									9					
185	20-11-94	C. E.	"	1			28		1	1			1				3			1					1		1				
186	25-11-94	P.	"	1			10		1	1			1			1	8			1							1				
187	26-11-94	B.	"		1		9										14				1										
188	26-11-94	P.	"	1			22			1			1			1	9			1							1				
189	30-11-94	W. K.	"	1			10			1			1			1	50 h			1							1				
190	6-12-94	T.	"	1		1	17						1				8			1											
191	8-12-94	E.	"	1			22						1				10			1											
192	10-12-94	B. S. O'C.	"	1		3	52						1				12											1			
193	15-12-94	J. S.	"	1		1	25	1					1				23 h										1				
194	20-12-94	E. B.	"		1	1	26	1	1				1				8				1						1				
195	26-12-94	G. M.	"	1			21		1	1			1			1	9			1							1				
196	27-12-94	Miss X.	"		1			1					1				6			1							1				
197	31-12-94	F. M.	"	1			18										11			1											
198	2-1-95	G.	"	1			18	1		1			1				30 h			1							1				
199	4-1-95	G. H. C.	"	1		3	26	1									4										1				
200	15-1-95	X.	"	1			36																				1				
201	27-1-95	J. E.	"	1			15			1			1			1	3			1							1				
202	1-2-95	A. H.	"	1			25		1	1			1			1	82 h			1					1		1				
203	2-2-95	M.	"		1		11		1	1			1				72			1							1				
204	2-2-95	J. B.	"	1			26		1	1			1				80			1					1		1				
205	4-2-	C. O.	"	1			30		1					1	1	1	52			1							1				
206	16-2-	M. H.	"	1		2	18							1	1		4										1				
207	21-2-	M. D.	"		1		8							1	1		8										1				

Recovery.	Hernia.	Death—hours after operation.	Post-mortem.	Sudden pain in abdomen.	Nausea or vomiting.	Local tenderness (increased).	Temperature.	Induration.	Gangrene of bowel.	Dry septic peritonitis.	Abscess cavity communicating with the bowel.	General suppurative peritonitis.	REMARKS.	CASE Referred by
1	.	.	.	1	1	1	100	1	.	.	.	.	Abscess close to liver, behind colon	Dr. Thometz.
1	.	.	.	1	1	1	99.5	1	.	.	.	.		Dr. Piper.
.	.	13	.	1	1	1	103	.	.	.	.	.	Moribund at time of operation; did not rally.	Dr. Neal.
1	.	.	.	1	1	1	99.6	1	.	.	.	.		Dr. Schmidt, Otto.
1	.	.	.	1	1	1	97.6	.	.	.	.	.	Patient in sixth week of typhoid. Died two weeks later sup. peritonitis. P. M. sent of opr. on appendix perfectly healed. Peritonitis from typhoid ulcer not perforated.	Dr. Schmidt, Otto.
1	.	.	.	1	1	1	101	1	.	.	.	.		Dr. Conley, T. J.
1	.	.	.	1	1	1	101	.	.	.	.	.	Abscess so small, could not be located before operation.	Dr. Conley, P. H.
.	.	12	.	1	1	1	101	1	.	.	.	.	Patient a tippler; extremities cold and pulse weak before oper.	Dr. Rohr.
.	.	34	.	1	1	1	99	1	.	1	.	.	Bowels excoriated; gloss absent.	Dr. Conley, P. H.
1	.	.	.	1	1	1	.	1	.	.	1	.	Abscess had opened into bowel previous to operation.	Alex. Bros. Hosp.
1	.	.	.	1	1	1	99½	1	.	.	.	.		Dr. Conley, T. J.
1	.	.	.	1	1	1	99	1	.	.	.	.	Patient's extremities and facial expression very bad at time of operation.	Dr. Thometz.
1	.	.	.	1	1	1	100½	1	.	.	.	.		Dr. DeWolf.
1	.	.	.	1	1	1	101	1	.	.	.	.	Same as case No. 101 in previous report.	Dr. Jennings.
1	.	.	.	1	1	1	.	1	.	.	.	.		Alex. Bros. Hosp.
1	.	.	.	1	1	1	.	1	.	.	.	.	Abscess situated under border of liver and over kidney.	Dr. Verity, W. F.
1	.	.	.	1	1	1	104	.	.	.	.	.	Appendix very much enlarged; typhoid ulcer.	. . . . .
1	.	.	.	.	.	.	.	.	.	.	.	.	Canal in appendix entirely obliterated.	. . . . .
1	.	.	.	1	1	1	98.4	1	.	.	.	.	Chill; very large abscess.	Dr. Riching, Rockford.
1	.	.	.	.	.	.	.	.	.	.	.	.	Drainage; rapid convalescence.	Hadsel, Elgin, Iowa.
1	.	.	.	1	1	1	100	1	.	.	.	.	Enterolith very large.	Dr. Cullen.
1	.	.	.	1	1	1	99.5	1	.	.	.	.		Dr. Whitford.
1	.	.	.	1	1	1	99.5	1	.	.	.	.	Peristalsis present. Normal gloss on intestine notwithstanding pus all over.	. . . . .
1	.	.	.	1	1	1	103.6	1	.	.	.	.	Appendix situated over spine at brim of pelvis.	Alex. Bros. Hosp., Niles.
1	.	.	.	1	1	1	102	.	.	.	.	.	Pulse 104 at time of operation. Peristalsis absent. Gloss on intestine. Appendix opened into cavity without adhesions.	Dr. Berry, J. G.
1	.	.	.	1	1	1	99½	1	.	.	.	.		Dr. Odbert, Indianapolis.
.	.	48	.	1	1	1	103	1	.	.	.	.	Had chill before operation. Great pain and tenderness following. Peritonitis continued till death.	Drs. Riley and Berry.
1	.	.	.	.	.	.	.	.	.	.	.	.		Dr. Conley.
1	.	.	.	1	.	1	101.5	1	.	.	.	.	Worked with pain and tenderness up to day before operation.	Dr. Thometz.
1	.	.	.	1	1	1	103	.	.	.	.	.	Peristalsis absent. Appendix gangrenous; not perforated; a drachm of pus around appendix.	Dr. Jas. G. Berry.
1	.	.	.	1	1	1	100	.	.	.	.	.	Peristalsis absent. Appendix perforated.	Dr. Pigall.
1	.	.	.	.	.	.	.	.	.	.	.	.		Dr. Harrigan.
1	.	.	.	1	1	1	98.4	.	.	.	.	.	Peristalsis present. Appendix had two perforations; abscess had opened into bowel. Previous operation one year previous to for abscess.	Dr. Geiger, Alex. Bros.
1	.	.	.	1	1	1	100.5	.	.	.	.	.	Peristalsis absent. Appendix covered with peritoneum of cecum; adherent in entire extent; infection through by nephatics.	Dr. R. Connell.
1	.	.	.	1	1	1	101.7	.	.	.	.	.	Peristalsis present. Appendix gangrenous at enterolith; two perforations located around abdominal wall.	Alex. Bros. Hosp.
1	.	.	.	1	1	1	101	.	.	.	.	.	Peristalsis present. Appendix gangrenous in center; easily shelled out.	Dr. I. C. Hurd, Post G. Hosp
1	.	.	.	1	.	.	.	.	.	.	.	.	Peristalsis present. Appendix obliterated in two places; one at junction with cecum.	Dr. Norman Bridge, St. Jos. Hosp.
.	.	24	.	1	1	1	103	.	.	.	.	.	Appendix gangrenous; much pus; bad expression.	Dr. McQuaig.
1	.	.	.	1	1	1	100	.	.	.	.	.	Appendix gangrenous in mucous membrane but not perforated and removed without rupture, full of pus.	Dr. J. H. Hoelscher.
1	.	.	.	1	1	1	99.8	1	.	.	.	.	Appendix partially gangrenous and perforated. Bowel excoriated, red and blistered; 2 oz pus, glass and gauze drain.	Cook County Hosp.
1	.	.	.	1	1	1	99.6	1	.	.	.	.	Appendix partially gangrenous and perforated. Abscess completely circumscribed.	Dr. Linden.
.	.	.	.	1	1	1	98	1	.	.	.	.	Abscess opened and drained.	Dr. Schaller.
1	.	.	.	1	1	1	100	.	.	.	.	.	Appendix allowed to remain; enterolith removed.	Dr. Synon.
1	.	.	.	1	1	1	100	1	.	.	.	.	Appendix gangrenous in its mucous membrane; pin hole perforation; 1 oz pus.	Dr. J. H. Hoelscher.
1	.	.	.	1	1	1	102	.	.	.	.	.	Appendix located over promontory of sacrum; packed & drained.	Dr. Jennings.
1	.	.	.	1	1	1	99.6	1	.	.	.	.	Peristalsis present; large abscess not adherent; appendix firmly adherent; not removed.	Dr. Eads.
1	.	.	.	.	.	.	98	.	.	.	.	.	Small pin head abscesses in wall of appendix; mesentery very much infiltrated, 1 inch thick.	Dr. Jas. M. Dinnen.
1	.	.	.	1	1	1	102	.	.	.	.	.	Appendix very much enlarged; full of pus; mucous membrane gangrenous and about to perforate.	Dr. J. J. Pierron.
1	.	.	.	1	1	1	100	1	.	.	.	.	Appendix perforated; large abscess; appendix rooted out from wall of abscess.	St. Joseph's Hosp.
1	.	.	.	1	1	1	100	1	.	.	.	.	Appendix perforated; large abscess close to liver; retro cecil, glass drain and gauze.	Dr. B. B. Eads.
1	.	.	.	1	1	1	99.3	1	.	.	.	.	Appendix not perforated; mucous membrane gangrenous; opening in appendix patulous; appendix enlarged.	Cook County Hosp.
.	.	.	.	1	1	1	103.2	1	.	.	.	.	Abscess situated over kidney; attack of pain, preceded 24 hours by chill; large quantity of pus.	Dr. J. H. Hoelscher.
1	.	.	.	1	1	1	101	1	.	.	.	.	About 2 drachms of pus around appendix; odorless pin hole perforation; firmly adherent.	Dr. P. B. Hayes, City.
.	.	.	.	1	1	1	99	1	.	.	.	.	Complicated with epididymetis; appendix very hard to move, buried behind cecum and colon.	Cook County Hosp.
.	.	30 h	.	1	1	1	102.1	1	.	.	.	.	Attack began 4 days before operation, very mild; patient up and about; evidence of rupture of abscess 4 hours before operation; general suppurative peritonitis; rupture of abscess; death 30 hours after.	Cook County Hosp.
1	.	.	.	1	1	1	102	1	.	.	.	.	Gangrene of appendix; recovery.	Dr. Cullen.
1	.	.	.	1	1	1	100	1	.	.	.	.	Patient gulping every few minutes; peristalsis absent on right side; much pus and serum.	Cook County Hosp.
1	.	.	.	1	1	1	102	1	.	.	.	.	Adhesions low down near pelvis; much pus.	St. Joseph's Hosp.
1	.	.	.	1	1	1	100.5	1	.	.	.	.	Patient's pulse bad when operated; very tympanitic; peristalsis quite marked.	Dr. McCarthy.
1	.	.	.	1	1	1	100.5	1	.	.	.	.	Appendix like a black rubber finger case full of pus; only slightly adherent; completely gangrenous; not perforated.	Dr. Lull.
1	.	.	.	1	1	1	102	.	.	.	.	.	Appendix full of pus; ulcerated mucous; occluded calibre; mesentery very thick from infection.	Cook County Hosp.
1	.	.	.	1	1	1	103	1	.	.	.	.	Extensive plastic peritonitis; appendix not perforated; down in pelvis; not removed.	Dr. Stamm.

clearly explained, but I believe it a reflex phenomenon, as we have exactly the same symptoms produced in obstruction of the ductus cysticus with gall stone. The appendix in cases of this kind is very much enlarged at the distal end—small at the proximal; its mucous membrane is thickened and contains a large quantity of hardened feces.

The mortality in my cases, including all grades, and operating on every case of appendicitis, favorable or otherwise, which came under my observation, is 9.93 per cent. Total number of cases operated to date 207. The following is a tabulated form of the cases operated on since my last publication, March, 1894:

In the literature of this subject, I wish to call attention particularly to the contributions, each presenting various phases of the disease to a greater advantage than the other, of McFadden Gaston, Kraft, McBurney, Fowler, Maurice Richardson, Bryant, Shrady, Wyeth, Sonnenburg, Robt. T. Morris, Senn and McArthur.

DISCUSSION.

DR. D. W. GRAHAM—In making a post-mortem a few weeks ago, searching for the cause of death, the appendix was examined and it was a good illustration of what we might call an abnormally developed appendix seven inches long. It was not bent on itself but was lying between the abdominal wall and the ascending colon, the end resting against the liver, over the kidney, and was perfectly normal in structure. It hardly had a mesentery at all, but was simply embedded in the peritoneum, at the line of reflection from the large intestine, on to the abdominal wall, and was perfectly straight.

I am satisfied that we have an anatomical deviation from what is called the average normal size and position of the appendix more frequently than is generally supposed, and I am satisfied also that it accounts for many cases which seem to be very erratic in behavior. Those cases, for instance, which Dr. Murphy has described where the abscess appears on the left side, I believe are accounted for by an abnormally long, displaced appendix. If the appendix I have described had become inflamed and an abscess had formed about its tip the abscess would have been in close connection with the liver and kidney, so that the most probable diagnosis would have been abscess in connection with the liver, or a perinephritic abscess. I recall a case where the attending physician had made a diagnosis of suppuration of the liver where the early history seemed to point to the appendix, but an abscess could be made out. I did not make any exploration but simply opened a large abscess and drained and in the course of two or three days the usual fecal stone appeared, showing that it was a case of appendicitis and perforation. I think more attention should be paid to the point I have mentioned, in studying the pathologic anatomy of appendicitis.

DR. A. I. BOUFFLEUR—It is somewhat gratifying to note that we are gradually coming around to a position where we admit that we do not know very much about what we have to deal with when we have a case of appendicitis, and we must also admit that we do not know when we should operate, unless it be immediately, as soon as we recognize the case as one of appendicitis. I think it is generally the case now that surgeons, especially, will admit that there is no such thing as stating what appendix is going to slough off, become neurotic and perforate, or what one is going to recover. Such being the case we have a good deal yet to look forward to in the line of the true conditions present in the different cases. That we may hope some time to be able to distinguish clinically between a catarrhal appendicitis and a destructive form of appendicitis is certainly something we must look forward to with considerable pleasure, but that we will ever reach that status I am not now thoroughly convinced. The specimens Dr. Murphy presents to us this evening are illustrative of some of the conditions from a pathologic standpoint which I think would bear a little further consideration in addition to that given by him. In the first case, the one in the large bottle, we have an appendix of reasonable length which is not especially thickened but has at the distal part about an inch of the surface of the mucous membrane which is distinctly necrotic. Now the reason for this necrosis is that there has been a thrombosis of the artery which supplies the appendix, which according to Fowler is usually a terminal artery or there has been a very intense inflammation which is always of microbic origin. If a thrombus forms in this artery we are sure to have destruction of the appendix beyond that point. Sometimes the artery goes to the end without giving off branches and then returns, in which case we will have destructive necrosis between the point of obstruction and the base of the appendix. When we have a case before us we do not know, whether in the course of a few hours that mucous membrane will necrose from the intense inflammation, or necrose as a secondary process to the obstruction of that vessel; and as a matter of fact it does not matter much, because both usually result in perforation and serious trouble. The next specimen calls up the inevitable stone, which as a matter of fact probably, plays a very small part in the production of appendicitis. I think the stone theory of appendicitis is losing ground rapidly. While it is present quite frequently yet it by no means has the prominence it formerly had in the production of this disease. It is asserted that the stone causes necrosis simply by pressure. The ordinary collection of feces which we find is so soft and small, compared to the lumen of the tube it could not possibly cause destruction in that way, but occasionally we do find one large enough and hard enough to cause pressure necrosis. The percentage of these little collections of feces that are hard enough to cause pressure atrophy is so small, according to Fowler, that we may look upon that as being practically no special cause at all. Furthermore, if you will take occasion to examine the appendix in laparotomies where it is supposed to be normal, you will find in the large majority of appendices these small collections of feces, without any symptoms of appendicitis. The third specimen, the recurrent one, I think is a very good illustration of what some prominent Eastern operator has found in cases of recurrent appendicitis, namely, that it is a parietal inflammation; in other words, there is more than the mucous membrane involved. Dr. Murphy spoke of this as a catarrhal inflammation, which is probably true of the mucous membrane, but here there is also, from ocular inspection through the bottle, considerable thickening of the interstitial tissue of the wall. In that case we have what is described as the second stage of appendicitis, or at least that stage which is manifest in the recurrent type or interstitial form of appendicitis. In addition, we have the next stage with the peritoneum involved. This classification is a convenient one and we may in time be able to differentiate between the three anatomic forms, but since the wall of the appendix is so thin and the infection is usually intense, we have rapid involvement of all the coats of the appendix which not infrequently ends in destruction. In view of the fact that we are as yet unable to determine which case is going to terminate fatally within a few hours, and also that an operation, when delayed, is practically useless in these cases, the primary or early operation is gaining favor very rapidly, and as it can be safely performed under the ordinary circumstances surrounding one in a house, it has a great many things in its favor as a legitimate operation. It is an easy and safe procedure unless too much is attempted. Emphasis should be placed upon the fact that it is not always necessary to remove an appendix to relieve the emergency of your patient's condition. In cases attended with abscess formation the mere opening of the abscess with thorough drainage will tide the patient over the emergency condition and enable you to subsequently remove the appendix under much more favorable conditions and give the patient permanent relief with the least amount of danger. I have seen two cases in which I am convinced, had I let the appendix alone, merely draining at that time and at a subsequent time removed the appendix, I would have given my patient a much better chance for recovery from the primary trouble and ultimate recovery from the whole trouble.

Again, as to the point Dr. Graham makes, I would say that the position he mentions is one of the recognized normal positions of the appendix, posterior to the cecum. We have four or five positions recognized as being normal although some are quite rare, and that is the reason why we have a change in the location of the abscess cavity, but when the appendix is involved the change in the location of the pain is as a rule very slight, if the appendix is on the right side of the body; the first pain being generally referred to indefinite parts of the abdomen, the second pain being referred to what is called McBurney's point.

DR. LE COUNT—I was very much interested in the last case reported by Dr. Murphy, where the appendix laid behind the cecum underneath the peritoneum. In the great majority of cases the appendix lies in the true pelvis on the right side; less often it is found behind the cecum; two

or three times I have seen the appendix in the position mentioned, and one very rare location was interesting to me where the appendix was entirely extra-peritoneal in the mesentery of the small intestine where that joins the cecum. We were unable to find it except by cutting the bowel open and probing the opening of the appendix. In the majority of cases it possesses a mesentery of its own. In regard to the terminal artery of the appendix, it certainly is surprising that in this condition emboli are not found more frequently. In regard to the necrosis that occurs, it is nearly always due to the specific action of the organism and not to pressure. One condition noted by Dr. Murphy was the rarity of catarrhal appendicitis. The condition usually is not an inflammation of the mucous membrane but begins as a microscopic abscess in the submucosa, in the lymphatic elements that in other conditions act as filters, and seem to act that way here. A coalescence of these takes place in the submucosa and in the mucous coat. I have examined two or three appendices from cases that were clinically catarrhal appendicitis and in all of them these microscopic abscesses were found in the submucosa, a condition that could not be called, in a strict sense, catarrhal appendicitis.

Dr. H. N. Moyer—When I was in general practice I saw, first and last, a good many cases of appendicitis and as far as I know none died, and none got well. I do not know of one that would not have been better for operation, which ought to have been made at once. I do not see any necessity of differentiating clinically. The only thing to do is to find that you have appendicitis and then operate.

Dr. J. B. Murphy, in closing the discussion, said: The last comment of Dr. Le Count is very interesting to me, and I wish to mention that in this case I call catarrhal appendicitis there are to be noted a number of necrotic spots; they look like ecchymoses, but they are not. There is an infiltration of the mesentery more marked than I have seen it in suppurative or gangrenous cases. I noted that the ligature cut the entire mesentery. I do not know that I understood Dr. Bouffleur in connection with foreign bodies. There were 4 foreign bodies in 193 cases, that means about 2 per cent. There were 38 per cent. of enlarged, hard, resisting concrements which produced trouble, not the soft material the Doctor speaks of. If he had reference to foreign bodies such as cherry stones, etc., being uncommon in connection with appendicitis, I agree with him, but the fecal stone is important when it is present in 38 per cent. of the cases. The one I show to-night is of an average size, and you can see that a stone as large as this existing in the appendix must produce pressure upon the wall. I was glad to hear Dr. Moyer, a man from the medical side of the profession, announce himself as he did, that we should make a diagnosis of appendicitis and be satisfied with that, not trying to make any further differentiation until we make the operation; then we can clear up the other manifestations, the same as Dr. Le Count does in a post-mortem.

SOCIETY PROCEEDINGS.

American Electro-Therapeutic Association.

Fourth Annual Meeting held in New York Academy of Medicine, New York, Sept. 25, 26, and 27, 1894.

William J. Herdman, M.D., President.

(*Continued from page 446.*)

DIRECT CURRENT DISTRIBUTION.

This automatic adjustment of the pressure to meet the constant requirements of a multiple system of translators may be somewhat imperfectly indicated by a water analogue.

When the apparatus here shown is at rest, the water stands on the same level L^5 in all the pressure tubes E, F, G, H, as was the case in Fig. 4. It is assumed that the rotary mechanism of the pump is constructed in four parts or sections fixed upon one shaft, each part revolving in a separate compartment of the inclosing box. One of the compartments is constantly open for the free circulation of the water, but the other three are controlled by gates or valves numbered 1, 2 and 3.

If now the shaft be revolved by its pulley at a constant speed, while the valves in the cross or multiple arc branches containing the three water wheels are closed, a pressure will be developed by the action of the constantly open section of the pump which will raise the water in the higher tubes to the levels L^1 and L^2, and allow it to fall in the lower tubes to L^3 and L^4, and this difference of levels between the higher and the lower tube will represent the pressure available for useful work in the manner explained in connection with Fig. 4. We may also assume that unless the speed be varied, this useful difference of pressure will remain constant while no wheels are operated.

Now let the valve of wheel 1 be open. A flow will take place through its multiple arc branch, and cause a revolution of wheel 1 and also a slow rotation of a turbine wheel indicated in the main supply pipe (through which all the water passes) and by means of a connecting shaft and bevel gearing, the centrifugal governor at the left of the sketch will also be revolved. When sufficient velocity is attained, the governor will raise gate 1, thus admitting additional water, until the amount of flow is sufficient to properly operate wheel 1 in spite of the friction of the current in the pump and pipes, this friction being compensated for by calling into action the first additional section of the rotary pump when gate 1 is opened. In other words, the pressure delivered by the pump at the cross branch which contains wheel 1 (which pressure was sufficient to properly operate one or more water wheels before any of them were set in motion) is by the flow of current which occurs when that wheel is started, maintained at the proper standard, and this operation of maintaining the proper pressure is brought about by the stimulation or reinforcement of the action of the pump which results from the current flow.

The starting of wheel 2 affords a second path for the propulsion of water through the closed system of pipes, and the greater volume of flow through the turbine wheel increases the rapidity of revolution of the governor and raises still farther the vertical spindle which it controls, until gate 2 is opened and a second additional section of the rotary pump is utilized. A further similarly increased action may be assumed to take place when gate 3 is opened. When any one of the three gates is closed as a result of stopping the revolution of one of the wheels and thus retarding the flow through the main or turbine wheel, a reverse action takes place, the volume is automatically diminished, and the pressure which would tend, in the absence of the regulating mechanism, to increase, and thus make the remaining wheels run faster, is maintained constant, and hence the action of the remaining wheels is unaffected.

A combination of the series and multiple arc ideas was suggested by Mr. Charles F. Brush, very early in the progress of electric lighting. The practical application of his idea is roughly illustrated in Fig. 10. Here a group of translators arranged in multiple arc is placed in each building or area and the different groups are connected in series. By this means the enormous mass of copper required for successful multiple arc distribution is greatly reduced, because a small current may be divided among a few lamps constituting one group, and transmitted through many groups successively over a small wire. While securing this desirable result of a reduction in the cost of conductors, this system is open to the danger which always attends a series circuit having many translators and therefore requiring very high voltage, and it is also defective in that the extinguishing of any translator increases the current through the others of its own group and tends to decrease the current through all the other groups. The practical difficulties which resulted from these conditions were so serious as to be prohibitory, and this method has never been extensively used in electrical distribution.

The difficulties which were inherent in such a multiple series system as that proposed by Mr. Brush were practically obviated for the purpose of large cities as well as of areas of more moderate size, by an invention of Mr. Edison known as the "three wire system." This method was in fact brought out simultaneously with Edison's publication in this country by Dr. John Hopkinson of England, and each of these inventors patented it in his own country. It allowed of avoiding the difficulties of the multiple arc system in a large investment for conductors, and the difficulties of the series system in the matter of independent control of each of the translators, or as I have said, it so far mitigated these difficulties as to make it practically feasible to spread incandescent lamps or motors of moderate size over a considerable area and enable them to supply numbers of scattered consumers, while each translator might be operated without affecting any other.

In Fig. 11 I have shown how this system is practically applied in lighting, for example, large areas of New York City. The two dynamos at the left of the sketch are connected in series; lamps in multiple arc are connected in groups between the positive or red conductor and the compensating middle conductor and also between the middle conductor

and the blue or negative conductor. The system, as a whole, may thus be said to be divided into two multiple arc sections or divisions, one on the positive and the other on the negative side of the middle wire, and these divisions are in series with each other, the larger portion of the current passing out on the positive, through the two groups successively and returning by the negative. While the system is balanced, that is while an equal number of lamps is operated in multiple arc in each of the two groups in series, the middle conductor by which these two groups are connected serves simply to carry the current from one subdivision of the positive section to one or more subdivisions of the negative section, and so simply has an "intergroup" function.

But as one of the objects of the invention is to allow of the individual control of every lamp, without affecting any other lamp, we find that when one of the positive multiple arc subdivisions is turned out, the dynamo on that side will send less current to the system, while the dynamo on the other side supplying the negative division will continue to send the same current as before, but the fraction of its current which is not needed by the remaining lamps on the positive side will pass up the middle wire and join near the lamps the current which has passed through the remaining positive lamps, forming with them a volume sufficient for the negative side. If, on the contrary, a reduction were made on the negative side, the current produced by the negative dynamo would be lessened and the excess of current on the positive side which was not needed on the negative would flow from the lamps toward the dynamo, through the middle conductor, thus making this middle conductor perform a compensating function between the two multiple arc groups which are operated in series.

By such a system as this thirty lamps, for example, may be operated by one-half the current which would be required if they were connected in simple multiple arc, and as a consequence of this reduction of current, the outgoing and return conductors may each be made one-half the size that would be required in the simple parallel system. In addition to this, inasmuch as this one-half the current is projected through the conductors with twice the pressure that would be exerted in a simple multiple arc system, the use of this double pressure allows of the further reduction of one-half in the size of the positive and negative conductors. In short, if the two outside conductors are each made one-quarter as large as before, they will perform their work as economically as before when connected in the manner shown in Fig. 11. The addition of the middle conductor (if of the same size as those on the outside), raises the expenditure of copper to three-eighths of that required in the simple parallel system.

A careful inspection of this figure, in connection with the numbers placed along the conductors indicating that current for so many lamps is flowing at the particular point at which the numbers are located, will show that the middle wire carries but small currents for any distance; that these small currents are in some parts of the system in one direction, in other parts in the opposite direction, and that in some sections of the middle conductor there is no current at all. This state of things exemplifies the normal functions of the compensating wire of the three-wire method, and it is because of this practical perfection of compensation that all the devices are independently controllable. It is usually considered necessary to provide each of the dynamos of such a system with means of independent regulation, so that if the circuit becomes materially unbalanced, the dynamos can be properly adjusted with relation to each other so that each will generate the total E. M. F. necessary to do its work successfully. In practice, however, where more than a half dozen lamps are to be placed upon one service, that is to say in one building or area, a branch from each of the three wires is introduced into the building and the translators are so connected as to place an equal number on each side of the middle wire. Thus a very close approximation to a local balance is maintained throughout the system, and departures from a close total balance are comparatively rare.

The incandescent lamps ordinarily operated on a system of this kind are made to work with 110 to 120 volts, according to circumstances. If such lamps could be successfully made for 220 to 240 volts and of the same candle power as at present, they might be connected across the outside wires of the three wire system, inasmuch as each of the three wire dynamos delivers a voltage equal to that required by lamps of the present type. With such high volt lamps a system could be operated with all the economy of the present three wire system as to cost of copper and drop in the conductors, and the middle wire might be omitted. Or, if such lamps were to be built for general use (and they have constructed in limited numbers) they might be connected with a three wire system as the 110 volt lamps are now connected, and the standard of voltage of each of the dynamos, and consequently of the system as a whole, might be doubled, thus providing for four times the number of lamps now operated within a given area, or for greatly increased length of conductors without exceeding the present percentage of conductor drop.

The practical importance, to the physician, of a correct conception of the operation of this law of the distribution of electrical potential along one or many parallel circuits, in proportion to the resistance encountered, receives clear illustration in the extreme case of applying currents fatal to human life in electrical executions. I have witnessed two such applications, and as a result of the first one, I had the pleasure of participating in the discussion of the able paper read by Dr. Carlos F. MacDonald before the New York Academy of Medicine, March 16, 1892. In this paper Dr. MacDonald summarized the phenomena which he had observed at the first seven executions under the present New York law. In response to his invitation, I analyzed the electrical conditions which I observed at the death of McElvaine, the Brooklyn murderer, for the purpose of pointing out the fact that a much greater electrical energy was applied than was apparently necessary to effect the result, because owing to the plan pursued in applying the electrodes, the greatest portion of the resistance encountered by the current was probably not in the vital organs, but in and near the surface contacts and the bony structure. As a result of this assumption (and I think it is susceptible of proof) the greatest fall of potential and therefore the greatest expenditure of joules of energy must take place outside of the brain and other nerve centers, and must fail to have any appreciable effect upon them and upon the heart and lungs, where complete paralysis is in such a case desired.

Perhaps I may be pardoned if because of my very limited opportunities for observing cases which seem to carry the most force to the physician's mind, I use this somewhat repugnant illustration, and reproduce a diagram made in connection with the discussion I have mentioned, and quote one or two of the points then emphasized.

In opening the discussion, our esteemed Fellow, Dr. W. J. Morton, remarked that it was not the mere voltage that must be relied upon to kill, and it seemed to me then as it does now, that from this text a practical sermon might well be preached by some medical authority, applying the principle to the remedial uses of electrical energy in your everyday practice. I may be able to so state the conditions that some one will thus draw the proper practical deductions.

Perhaps a desirable form of expression is that the lethal or remedial effects which attend the flow of a given current, at a given density in any tissue, for a given time, are proportionate to the distribution of fall of potential or expenditure of the total applied voltage.

I think I may say that the fact that alternating currents were used at the execution of McElvaine does not probably cause the problem to vary in any great degree from the conditions expressed in the diagram now before you. In its details I have for simplicity assumed that no variation is met, and the force of the lesson we may draw is not lessened, though it may be found that new factors are introduced by the substitution of alternating currents of varying periods, for the direct distribution to which I am supposed to restrict myself.

To apply a pressure of 1,000 volts, alternating from 200 to 300 times a second, and maintain that pressure for an appreciable time against the resistance of the human body, from the forehead to either leg below the knee, does not probably greatly increase that resistance at the instant of contact. Or, if it has such an effect, the maintenance of the so-called current reduces the effective resistance so speedily that we get from 1,000 volts, an expenditure of energy at such a rate as snuffs out the life of the criminal more quickly than neural impression can be carried from the point of contact to the seat of sensation in the brain.

The energy that kills is therefore (with a given frequency) the product of three factors: 1, the electrical pressure or electro-motive force that is applied to the surfaces of the body; or, in more accurate technical language, the effective difference of potential (in volts) between the electrodes, shown by the Cardew voltmeter; 2, the rate of expenditure of this potential in each unit of resistance (or impedance) in the body, or the number of volts fall of potential to the ohm

(amperes) shown by the ammeter; 3, the time (seconds) shown by the stop-watch. The volt-amperes (watts) give the rate at which the work of destruction is going on; the volt-ampere-seconds (joules) are the measure of energy expended or heat developed in the body during the time of contact.

There is another condition to which I have barely alluded, namely, the "density" or degree of concentration of the current, and the resulting energy expended through the vital centers. While the path of greatest strength of current—or in other words, greatest expenditure of watts—is usually represented by the shortest route or nearest approach to a straight line between the electrodes, this is an exceedingly general statement and the exceptions will probably be found to be numerous. The correct view is probably that the densest current is usually the most direct, with less and less effect on either side, because with increased distance to be traversed, the resistance is greater.

None of these factors are well settled as yet in their relation to the energy actually required to cause instant and painless death. By "death" I mean, now, not alone cessation of consciousness of a perfectly healthy human being in an interval too brief for thought to measure, and the establishment of conditions which produce gradual and final expenditure of the stored nervous energy of the brain and the subordinate centers of distribution of vital force—such as the pneumogastric nerve and the spinal column—I mean, also, total paralysis of all the vital organs and of the nerve centers by which they are directly or indirectly vitalized, so that when the current is broken there can be no reflex action of the muscles, such as would indicate the presence of residual life energy or a possibility of its resuscitation.

I think none of these factors are settled, because it is not yet known how small a resistance may be found when only those parts of the body which must be paralyzed, and only the surface tissues which most readily lead the current to those parts, are included in the circuit. That the contact surfaces used in practice are excellent (and satisfactory) no intelligent witness of one of the later executions will deny. The peculiar scalding effects of the current at the edges of each of the electrodes nearest to the electrode of opposite polarity, and for some distance along the track most readily followed by the greatest density of the current, has been attributed—erroneously, I think—to the contacts themselves, and to the idea that accidental surface moisture has been followed by the current and heated till dissipated in vapor.

In the diagram Fig. 12 I have tried to indicate graphically that near each electrode the area of comparatively good conducting material (moisture-filled tissues) which lies in the line of least resistance, is limited, and a high degree of current density results, until in its course from one electrode toward the other the current finds an expanded path and can spread itself over a larger area without departing very much from a direct line, or at any rate without encountering largely increased resistance. Within this area of great current density or large expenditure of volts to the unit of cross-section of the connecting tissues, the few blood vessels, nerve channels and moisture ducts oppose so great a resistance to the rush of energy as to occasion a great drop of potential, and thus great heat, and the moisture is quickly raised in temperature to the scalding point. Much of it must have been turned to steam under the epidermis and perhaps in the minute blood vessels, and those portions of the body close to the electrodes are parboiled if a large current is maintained.

A little reflection, even from the standpoint of a layman, suggests that with the exception of the 490 watts or 18,000 joules assumed to be expended in and near the vital organs, this large energy may be regarded as uselessly applied. The correctness of this general view was suggested to me by the intensity of the heat observed at the electrodes and the fact that the temperature which I measured at the knee joint was 120 degrees F. (or higher) for nearly two hours after death. Could the same amperes be expended exclusively at the life centers, it might be found that only a low alternating voltage, perhaps 100 or 200 (with 100 to 200 periods per second) would be ample, and that such a concentration in the centers of nervous activity might allow of the reduction of the time to a fraction of that which has thus far been considered necessary.

The idea of "concentration" or great "density" of current is I think best illustrated by imagining the body to be made up of a number of separate paths or circuits connected in multiple arc. In Fig. 13 I have imagined that the brain and spinal cord form a path of low resistance, (say 25 ohms); that outside of this main channel are two circuits of higher resistance, (say 50 ohms each) representing the heart, lungs and that part of the circulatory system within the trunk; that farther out are two others, still higher (say 100 ohms each). The same voltage (70 volts) being expended in all these five paths, the sub-divided currents through them vary inversely as their resistances, and the central channel receives two-fifths of the entire energy expended in the group. The joint resistance of all the paths is by this assumption only 10 ohms.

It is interesting to note that within the past year the method of applying the current in these executions has been modified to the extent of keeping up the full voltage for only five or ten seconds, and then reducing it to 200 or 300 volts, sufficient to maintain the sudden rigidity of the muscles and complete the permanent paralysis of the nerves which is brought on by the first powerful shock. As a result, after a contact of something less than a minute's duration, there is a complete collapse, with no reflex muscular manifestations or apparent tendency to resume the normal functions of life, and no objectionable scalding of the surface tissues because the maximum heating energy is applied for so short a time.

I have thus illustrated what would to a non-professional mind seem a matter of great importance, namely the determination of the relative resistance of various parts of the body, with the forms of electrodes adapted to the work of electro-therapy and under the influence of the different currents now used. This would probably give more accurate ideas of the effects produced internally by external application of electrodes of given form and area of contact, and point the proper practice in concentrating or diffusing a given current flow under given physical conditions.

During the discussion of which I have just spoken, Mr. A. E. Kennelly, then consulting electrician at the Edison Laboratory, with whom I attended the execution of McElvaine, made a suggestion which is best expressed in the words of his letter to me:

"I think that a high pressure brought to bear upon a man's body between any two points, finds the resistance initially just what we measure it by the bridge, but that it breaks down at a rate rather difficult to foresee. Also that valuable experimental measurements could be made (as you suggest) of the resistance in different parts of the body, *A B*, in the diagram. (Fig. 14.) A battery or dynamo current (direct or alternating) is applied, of the right and readily-supported strength, at convenient points, (say the extremities *C* and *D*) by means of wet bandages. Sponge-faced electrodes, *F*, *G*, connected with an electro-meter *E*, are then moved from point to point, various distances apart, and the fall of potential studied. I suspect—without pretending to know—that the resistance of the body and its distribution from point to point mapped out by this method, would be maintained in ratio or relative proportion under fatal pressures, even though the absolute resistance fell everywhere.

"I think that an accurate knowledge of the resistance from point to point of an average human body might assist occasionally in the diagnosis of disease, and the comparison with the resistance of a corpse might have useful results to show."

That eminent scientist and teacher, the late Prof. John Tyndall, has left upon the pages of modern progress a record which every student of the physical sciences should examine with minute care, in an address delivered at the Royal Institution of Great Britain early in 1879; he made the following beautiful expression:

"It was my custom some years ago whenever I needed a new and complicated instrument, to sit down beside its proposed constructor and to talk the matter over with him. The study of the inventor's mind which this habit opened out was always of the highest interest to me. . . . Such minds resemble a liquid on the point of crystallization. Stirred by a hint, crystals of constructive thought immediately shoot through them. . . . They have the penetration to seize the relationship of facts and principles, and the art to reduce them to novel and concrete combinations."

If my fragmentary remarks on this subject of electrical distribution have conveyed a hint to some such mind, the highest object of my paper has been accomplished.

DISCUSSION.

DR. J. H. KELLOGG of Battle Creek, Mich—said he had been especially interested in the last suggestion of the speaker as to the varying resistances of the body being made a means of diagnosis. The same thought had occurred to him four or five years ago, but he had found what seemed to be an insurmountable difficulty—a variation in the thickness of

the skin in different individuals, and the difficulty in so adjusting the electrodes as to have identical conditions. He had concluded that the only accurate method would be to introduce the electrode beneath the skin. Another difficulty which he had met with was the fact that the skin itself presented such a large proportion of the resistance of the entire body that there would be but a very small margin for investigation as to the variations in the different bodies. He would like to have the reader of the paper propose some way of overcoming these difficulties.

MR. JENKS said that his knowledge did not extend beyond the suggestion, in fact this suggestion had been made to him by Mr. Kennelly. He was not aware that any experiments had been made which would throw any further light on this subject.

DR. MORTON said he did not wish such a valuable paper to pass by without saying something in recognition to the author. He did not feel competent in any sense to discuss those intricate electrical problems from the standpoint taken by the author, but there were certain questions which suggested themselves to the minds of physicians. He had been especially interested in the statement that physicians were applying a certain amount of *energy* to the living organism—energy against energy. He was also pleased in the reduction of the expression energy, to terms which we could all understand. If the physician used the Franklinic current his mind was occupied with electro-motive force; if he used the constant current, then current strength was prominent in his mind, etc. We first thought a great step had been made when the milliampère meter was introduced, but we now know that we should take into consideration also the question of voltage.

It was true that we might express electrocutions in terms of horse-power, and speak of them as two, three or four-horse-power deaths; the author said we must go still further and take in the elements of time and express the effect of the current in joules. This would mean that we must go still further in our practical work and express it also in joules.

This subject of electrocution was a grewsome one, and in his opinion we, as electro-therapeutists and physicians had nothing whatever to do with it. We should relieve and cure people and not deliberately take any part in causing the death of any human being. So far, he had always refused to witness these executions, although he had been invited to do so. He believed with Monsieur D'Arsonval, who put forth that startling theory that these criminals were not really killed by electricity. He thought it was even now a question of the old Scotch verdict, "not proven." This being the case, the person performing the autopsy was responsible for the death of the criminal, so the responsibility was again turned upon the medical profession where it did not belong. In order to prove that the death was due to electricity, we should wait for decomposition to occur, and not perform an autopsy within a few minutes after the application of the current.

In conclusion, the speaker said he welcomed such a paper, and particularly the subject of measurement reduced at last to one of energy instead of voltage and current strength.

DR. DICKSON said he agreed with the last speaker that when we stopped at using the milliampère meter we had not done all we should do.

(To be continued.)

Louisville Academy of Medicine.

Regular meeting was held March 18, 1895.

DR. I. N. BLOOM was the first speaker, and said: I wish to show this negro woman, about 40 years of age, whom I saw for the first time on February 22, having been sent by Dr. Satterwhite. At that time she exhibited an eroding ulcer, about the size of a penny piece, involving the left ala of the nose, on its outer margin. While I was in some doubt as to the diagnosis, between epithelioma and lues, I noticed her fingers, which present the characteristic signs of hereditary syphilitic dactylitis. The woman, however, says that her fingers have only become so in the last two or three years. She was married about twenty years ago, but has been separated from her husband a number of years. In addition she complained, when she first came under my observation, of severe headaches, not to be located in any one part, more severe at night. Under the mixed treatment these have almost disappeared, and as you can see the ulcer upon the nose is almost entirely healed. I show this case chiefly on account of the dactylitis. These cases are seen with extreme rarity. I was in the hospital in Vienna for years, as Hospitant, and saw very few cases. In out-patient, hospital and private patients, I do not think I have seen more than twelve cases. The text-books would lead us to believe that they are common. I have not seen them, and would like to ask if any of the Fellows have seen a similar case. I see typical cases of syphilitic manifestations repeatedly. This case presents no other features of interest.

DR. T. C. EVANS—I happened to be present in Dr. Bloom's office when this patient came in, and noticed the dactylitis. It has the appearance of that seen in congenital syphilis. I have seen five or six cases in children with hereditary syphilis, but this is the first case I have seen of acquired syphilis with dactylitis.

DR. AP MORGAN VANCE—It perhaps happens that the general surgeon sees a good many more of these cases than the specialist, he being consulted for some "bone trouble." I have seen considerably more than a dozen cases, I think, in my fifteen years' experience.

DR. W. C. DUGAN—I wish to show a specimen removed from a case operated on yesterday. It is the omentum and sac removed from a femoral hernia. There is one point I want to bring out in reporting the case: Day before yesterday at 2 o'clock, she complained of pain in the femoral region; her family physician was called in and diagnosed femoral hernia. He used taxis for a few minutes as did the patient also without success. I was sent for and found a large tumor in the groin, no pulsation or coughing, no tympany. Pulse 80, and good. No perspiration. The patient was inclined to joke, in fact, all the symptoms showed there was no great impression of the nervous system. I looked on the case rather as an omental hernia than an intestinal, and was inclined to let it go until morning, but fearing there might be a small piece of gut, I operated that night. Dr. Evans administered the anesthetic. An incision was made through the abdominal wall, not cutting in through Gimbernat's ligament as usually advised, but Poupart's ligament, cutting through the sac, and made a radical cure. Here was a case with a pulse under 80, no constitutional distress, had vomited only a few times, yet the gut was almost gangrenous. This shows that we can not tell what we are to find. If I had let her go until morning, gangrene would have occurred. She is doing well now and will soon be up.

DR. VANCE—I think Dr. Dugan was right in not letting an incarcerated hernia go from night until morning. It is right to give the patient the benefit of the doubt.

The paper of the evening was read by DR. John F. BARBOUR. Subject,

THE PRESENT STATUS OF LINEAR CRANIECTOMY.

The author stated that the first case operated upon was by Dr. Fuller of Montreal, in 1878, for idiocy, and that the operation was not done again until 1890, when Lannelongue performed it. The latter's statistics were quoted. These were written four years ago, but since he has been silent. All reports lack as to the state of the patient before operation. Its object is to give full scope to the brain by lessening resistance, there being premature ossification. The following pathologic conditions were mentioned as causing idiocy:

1. Microcephalus.
2. Hydrocephalus.
3. Arrested development of the convolutions.
4. Poroncephaly from congenital malformations.
5. Pseudocysts from pathologic malformations.
6. Hypertrophic sclerosis.
7. Atrophic sclerosis.
8. Tumors of the brain.
9. Meningitis chronic meningo-encephalitis.
10. From pachydermatous or myxœdematous cachexia due to absence of thyroid gland.

Eighty-nine operations were tabulated. There were sixteen deaths; the results were practically *nil*, in twenty cases; of the remaining fifty-three, four recovered from the operation, one had epileptiform attacks less frequently, and in forty-eight there was improvement but the details were meager and unsatisfactory. There is hardly an operator who has submitted a later report. The history of the case reported, which occurred in the writer's practice, was as follows:

There was no history of syphilis, idiocy or insanity in the family. At four months the anterior fontanelle closed, and the symptoms dated from this time. There was no sphincteric control; the child could not sit alone erect, it had a pained expression, low whimpering, epileptiform seizures as many as twenty-four times in a day. She was extremely restless, recognizing only her milk bottle. The operations were done by Dr. Vance—linear craniectomy April 6 and

June 16, 1893. The immediate effect was remarkable. Three hours after, when spoken to she noticed, and followed a bright toy with her eyes; had an intelligent look, and the pained expression was gone. The subsequent history is that the child is in even worse condition than previously, but the epileptiform attacks are less frequent.

His conclusions were as follows:

1. Premature synostosis of the cranium does not occur in idiocy.

2. The arrested growth of the skull is due to the arrested development of the brain and not *vice versa*.

3. The lesions to which idiocy is due are profound, varied, extensive and by no means susceptible of relief by craniectomy.

4. The results obtained by operation are slight, doubtful, or *nil*. So that over against this operation we must write in letters of fire: "*Mene, mene, tekel upharsin.*"

DISCUSSION.

DR. VANCE—I have operated twice for microcephalus by linear craniectomy. The first patient was 9 years of age, and died seven hours after the operation from an accident, I take it, caused by boiling water being used in the irrigation. The second case described by Dr. Barbour is not improved. I saw the case a short time ago, two years now since the operation, and it is the subject of inanition, the mother never having been able to get it to take anything but the bottle. I agree with the essayist perfectly that craniectomy should be obsolete, especially in the light of the causes of idiocy. The operation in itself is not very dangerous. I think it possible that the instruments used take too narrow bites and the bone perhaps can ossify, as shown by one of the illustrations exhibited by Dr. Barbour. This is especially the case with the one devised by Keen, of Philadelphia; the one devised by Hopkins is wider. I will not do the operation again.

DR. W. C. DUGAN—There is only one logical conclusion in regard to this operation, and that is that it should not be done. I have operated twice; that is, have examined the brain of idiotic children post-mortem. One was a boy 16 years old, who died at the asylum from an attack of malignant dysentery. In taking off the scalp it was noticed how short was the bi-temporal diameter. As soon as the calvarium was detached the intracranial pressure was shown, and afterward the skull top could not be pushed down. The connective tissue predominated and explained the size.

At a meeting of the Kansas State Medical Society in 1885, a child was shown, and I noticed this same condition, a short bi-temporal diameter, and advocated the operation of multiple trephining to allow expansion, not knowing it had been previously done. I think that the premature ossification is due to lack of brain development rather than the opposite.

DR. WM. BAILEY—I think the pathologic conditions are in doubt as to the cause of this premature ossification. In the case which Dr. Dugan reported, where did the extracranial pressure come from if this were not a case of early bony development? I agree with the conclusions offered by the essayist. I consider of the eighty-six cases reported, the sixteen which died were the most successful.

DR. BARBOUR—I suppose that in the course of time, when we become more civilized, we will give those who are so congenitally undeveloped as to be hopeless, the benefit of euthanasia. It is a significant fact that no second report is made by any of these operators. The primary effects of the operation are remarkable, and many of the brilliant reports are due to this temporary effect. I can not understand why they are produced. I think the bottom has fallen out of the operation thoroughly.

DR. W. C. DUGAN—I have a case under my observation which is causing me no little anxiety, and I wish to report it, hoping that some Fellow of the Academy can help me out: The patient is a member of a prominent family. She has been a nervous character all her life, and there is a nervous element in the family. She has been in the hands of various surgeons and physicians. The question in my mind is, Should the menopause be brought on? At the time of the menstrual periods she is worse, but during the month she is more or less nervous. She is not satisfied with anything and wants to run away. She complains of pain in the womb and left side—on examination nothing marked could be found; slight tenderness on the left side; the right ovary only could be felt. Are we justified in bringing on the menopause? To-night she is very nervous, though it is the middle of the interval between periods. She has these spells of what might be called hystero-epilepsy and remains in them for a number of hours. She eats but little, but is fairly well nourished. She is about 26 years of age and married, has conceived three times but aborted at two or three months. She wants the operation done.

DR. F. C. WILSON—It seems to me that the operation of ovariotomy in this case would be justifiable. As far as child-bearing is concerned, the prospects are it is unlikely, if she conceived, that she would go to full period of gestation.

DR. VANCE—It seems to me possible that the malposition of the left ovary might explain the nervous phenomena. I would certainly make an exploratory incision, and if the ovaries were healthy would leave them.

DR. FRANK—The subject is very interesting and important, and a difficult question to decide. I believe that an exploratory operation is justified, and if it is found that one or both ovaries are diseased they should be removed. I do not think one is justified in removing appendages which are perfectly normal. I believe that the consensus of opinion is that the ovaries have nothing to do with such attacks and few patients are benefited by operation.

One year ago I had under my care a patient who had hystero-epileptic seizures at menstrual periods, and there was always great ovarian tenderness. She was 19 years of age, menstruated first at 14, and married one and one-half years later. I operated and found the ovaries apparently normal, and contrary to my better judgment, the patient having previously begged that something be done for her relief, I removed both ovaries and tubes. On section the ovaries showed numerous cysts not Graafian follicles, but destroyed ovarian structure. The tunica albuginea was very dense over the ovaries. This case is similar to Dr. Dugan's. I do not believe one is justified in removing ovaries if no pathologic lesion is seen. Seven or eight months after the operation on this patient was done she was having no attacks and was well.

DR. WATHEN—I am sorry I did not hear the report of the case that I might speak of the subject more intelligently. I have done the operation a good many times for great nervousness, removing ovaries that were not enlarged but partly or entirely cirrhotic. In these fortunately I have had almost universally good results; all were practically restored to health; several had been invalids for years, one for thirteen years, and all could walk about within a few weeks. Those cases of hystero-epilepsy have not done well; all recovered from the operation and apparently for awhile were better, but they usually recurred. One case was very much benefited, but the tube was found filled with pus, and this probably had been the cause of the trouble. It has been the experience of abdominal surgeons who have operated on a great number of these cases that the results have not been satisfactory. In the operation done for hystero-epilepsy when there are not well marked lesions, unless it is plainly shown that the sieges are due to the ovaries, and so far as we can judge caused by ovulation and menstruation, we should remove the uterus with the ovaries and tubes. If done through the vagina nothing is added to the mortality and there is no abdominal wound left for a hernia to develop.

In conclusion, I would say that I am opposed to the removal of the tubes and ovaries for the relief of hystero-epilepsy unless we are convinced that ovulation and menstruation are the cause of the trouble.

DR. DUGAN—I have operated on two cases for hystero-epilepsy and both are well. One, Miss F. H., aged 22, had been an invalid for many years. She had epileptiform convulsions at her periods with melancholia in the interval. She was emaciated and had been bed ridden most of the time for two years. She was operated on at St. Joseph's Infirmary, under chloroform. She had great trouble from vomiting for four or days, but afterward nothing but hot flushes for eighteen months. The ovaries were cirrhotic, like cartilage, hard and fibrous. When operated on she weighed 100 pounds; she was perfectly well a short time ago when I saw her, weighed 180 pounds and said she did not know what it was to be sick. With such an experience I am inclined to go back and practice what others have discarded.

DR. FRANK—Two weeks ago I saw a case in consultation, and made the diagnosis of appendicitis, but advised waiting for urgent symptoms. The patient was up and out of bed, bowels alternating constipation and diarrhea. There was pain in the right iliac region and a marked tumor on the right side pointing in the direction of the axillary line; it was hard, painful and fluctuating. There was no doubt as to the diagnosis. The remarkable thing is that the man has been up and about, has a temperature, pulse 102, chills irregularly, and perspiration every two or three days. I will operate tomorrow.

CHORUS—"Operate to-night!"

SELECTIONS.

Cow's Milk, its Sterilization and the Nourishment of Children.—The article under this heading in the *Berliner klin. Wochenschrift* by Biedert is chiefly polemical and directed against Heubner. It contains no new facts of importance, but its essential drift is to show that in the depreciation of the fitness of milk as food for children, the chemic composition of the same from the bacteriologic standpoint must be regarded of prime importance. The superiority of mother's milk to cow's milk in this connection must never be forgotten. In conclusion, the writer calls special attention to the advantages of his cream mixture and its increasing recognition. —*Centralblatt für innere Medicin.*

Two Cases of La Grippe of Pseudo-phthisical Form.—(Chatin and Collet in *Lyon Med.*, 1894, No. 41.) These writers observed two cases of influenza with pulmonary complications which they were forced to regard as phthisis from the physical examination. There existed dullness on percussion over the apices, sonorous râles, cavernous respiratory murmur, copious, purulent, nummular sputa. In one case the diagnosis of phthisis was given up, because there was no fever and no loss of weight and especially because no tubercle bacilli were found in the sputum. The other case proved fatal, and the autopsy showed edema of the lungs, splenization at the apices, no sign of tuberculosis, no broncho-pneumonia, no caseous foci. Similar observations have been made previously.—*Centralblatt für innere Medicin.*

The Influence of Erysipelas on the Course and Termination of Asiatic Cholera.—N. Blagowjeschtschenski (*Medicinskoje Obosrenje*, 1854, No. 15), during the cholera epidemic superintended the bacteriologico-clinical station opened in Merv (in the trans-Caspian province), and observed here, among 300 cases of cholera in hospital, with a mortality of 52 per cent., the coincidence of this disease with erysipelas four times. In these cases, in all of which the diagnosis was confirmed bacteriologically, the erysipelas was first manifested during the algid stage on the third or fourth day of the disease. In every case the appearance of the eruption influenced favorably the course of the cholera. The low temperature yielded at once to the high temperature curve of erysipelas. Diarrhea and cramps ceased immediately and the general condition of the patient became markedly improved within twenty-four hours. The languor disappeared, urine was excreted, appetite and sleep returned. The course of the erysipelas was also relatively light and the eruption not extensive. In conclusion, he writes: "If one can assume that, under the influence of the toxin producing cholera, the heat center in the organism is paralyzed, in the same way it can be accepted that this center under the influence of the erysipelas toxin regains its irritability."—*Centralblatt für innere Medicin.*

Retention of Water in Fever.—Contribution to the Question of the Importance of Ingestion of Water and Increase of Elimination in Infectious Diseases.—(Julius Glax at the celebration on the completion of the thirtieth year of the Professorship of A. Rollett). The writer formulates an opinion, based on fifty-three cases of typhus (abdominalis) on the question often answered contradictorily, whether the human body retains water in the tissues during fever, or on the contrary is deficient in water. The urine was collected and no case included in which diarrhea was too free. Treatment, cool bathing and galvanization at the neck. Amount of water ingested was noted. He concludes that there is a conservation of the water supply during fever, and in convalescence an increased elimination, frequently coincident with the decline of temperature and at times an indicator of speedy complete defervescence. On the other hand after the initial chill and subsequent rise of temperature, the elimination is usually increased for a short time. The explanation is that at the onset of fever, while the blood pressure is yet high, the diuresis occurs, but a diminution ensues as the pressure becomes lower and a still later increase as strength returns. If strength is not much impaired, the elimination is only correspondingly decreased. An increase in ingestion of fluids increases the elimination in most cases only after defervescence has begun, while during the height of the fever, diuresis appears to be more favorable, the more limited the ingestion. The recommendation of Cantani and Sahli, that infectious diseases be treated by increased supply of fluids to cleanse the tissues is combated at some length as founded on false premises. In conclusion, the assertions of the writer are easily reconciled with the fact that by drinking cold water in health the temperature and pulse are lowered, and diuresis occurs, for this happens only when the heart and blood pressure are normal.—*Centralblatt fur innere Medicin.*

Influenza and Accompanying Pneumonia During the Last Epidemic, 1893–94.—Gineiner (*Prager med. Wochenschrift*) had the opportunity to observe 403 cases of influenza in Donawitz by Leoben between Dec. 10, 1893, and March 11, 1894; 6.9 per cent. of all the inhabitants were attacked, three times as many adults as children, and three times as many men as women; 27 per cent. of the cases occurred between the ages of 30 and 40, and no child under 1 year was included. The largest number lived on the ground floor (50.1 per cent.), while the third story held the fewest (5.5 per cent). The most commonly observed group of symptoms was: sudden chill or chilliness with a temperature of 39 to 40 degrees C., aching, feeling as if one had been beaten, heaviness of the head, anorexia and constipation. These symptoms lasted on an average two or three days. It was never possible to recognize signs in the lungs in the first days; these, beginning later, belong rather to the complications. The nervous system was very seldom affected, but neuralgia was often seen as a sequela. Protracted dyspepsia was a frequent complication, and quite often enlargement of the spleen. Acute nephritis in 1 per cent. of cases. Ninety cases of influenza, also 22.3 per cent of all forms of sickness, were complicated with pneumonia, and of these 64.4 per cent. were in men, 14.4 per cent. in women, and 21.2 per cent. in children (none below 10 years of age). Almost all the children were attacked with pneumonia as a complication, but those patients between 30 and 40 years of age were best able to withstand the severe attacks. The greatest percentage of cases complicated by pneumonia (56.6 per cent.) and also the greatest mortality (27.4 per cent.) occurred among those living on the ground floor. The influenza pneumonia was distinguished from croupous pneumonia by the heavy sweats which were present from the onset, but which did not influence the temperature. The type of fever was also different. The decline was more commonly by lysis than by crisis. Meningitis complicated ten pneumonias (11 per cent.) on the fifth to the eighth day, always with fatal termination, while Jürgensen states .5 per cent. as the ratio of meningitis in croupous pneumonia. While in croupous pneumonia generally after complete consolidation the condition remains stationary until the temperature falls, in influenza pneumonia the condition was always changing, one area beginning to clear, while another previously free, suddenly became infiltrated. The sputum was generally rusty. The mortality in influenza pneumonia amounted to 27 per cent., and was largest among the elderly patients; no child died. It is interesting to note, that during the influenza epidemic, no other infectious diseases prevailed except a few cases of typhus (abdominalis). Sickness increased with the lowering of air pressure and temperature; cloudy weather increased the disposition, but no influence could be ascribed to a precipitation of moisture. The direction of the wind, on the other hand, seemed not without influence, for in a valley lying south of Donawitz, which had hitherto been exempt, suddenly in the early part of February the residents of various houses were attacked, and records show that from the end of January the wind was constantly from the north. Surely the wind bore onward the specific cause, since a direct transfer by means of the existing active intercourse would have been accomplished much earlier.

The greater disposition to the sickness among those living on the ground floor, which is also the case, according to Buchmüller, in croupous pneumonia, and also the firm hold of influenza on certain houses, led the writer to the conclusion that the cause is developed in the earth, and thence reaches the dwellings. Since he was never able to find a direct transfer from person to person, he regards influenza as a miasmatic infectious disease. The chief complication, pneumonia, might also be induced by the same influence.—*Centralblatt für innere Medicin.*

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SATURDAY, MARCH 30, 1895.

THE BOARDING OUT SYSTEM FOR THE CHRONIC INSANE.

The January issue of the *American Journal of Insanity* contains an interesting article on the Scotch system of caring for the insane in private houses, a system that while not peculiar to Scotland, has probably there reached its best development. The observations therefore of a competent observer like DR. RIGGS, the author of the article, have a decided value as showing the success or otherwise of the plan, as it appeared to him under the most favorable conditions. The noted colony of Gheel which has been often described, with praise or condemnation according to the predilections of the observer, is probably no better, if indeed it is not much worse, in its management than the Scotch system of guardians under the constant and direct supervision of the Lunacy Board.

DR. RIGGS' conclusions are, on the whole, very favorable to the system as he saw it, and yet he does not feel ready to recommend it for adoption in this country under our present conditions. It is doubtful whether we can find here any communities like those of Gheel, Balcurvie or Kennoway, or if we could, it would be our best resource for the care of any large proportion of the chronic insane. There we find communities that have grown up with the care of the insane as their chief means of support, and which would probably cease to exist as communities without this. This in itself, indicates a state of affairs which we ought not to be anxious to bring about, though with the increase of density of population, and the consequent greatly augmented difficulties of making a livelihood, we may yet come to it in some parts of our country. In Scotland these aggregations, it must be said, are not favored by the Lunacy Commissioners who prefer to see the insane a less predominating portion of the population than is the case in Gheel and some other localities.

DR. RIGGS shows further in his very clear *exposé* of the system and its method in Scotland, that in its inception it was only an obligated alternative to overcrowding asylums or multiplying them beyond the capacity or willingness of the taxpayers, and its success has been rather greater than was at first expected. Indeed, the Scotch commissioners and superintendents are mostly partisans of the system at the present time. That it has some disadvantages, however, can be readily seen from his account. The presence of the insane does not make the communities attractive to outsiders, and even with the almost ideal supervision of the Scotch Board of Commissioners he observed some defects of management that were undesirable and, had he had a chance to make more than a mere casual inspection, it is probable he would have seen many more. In a well managed asylum it is impossible but that some undesirable things should occasionally occur, and even with the best selected dements, the chances for their occurrence are almost infinitely multiplied in the necessarily laxer discipline of the boarding out system. It relieves asylums and it is therefore naturally to be expected that it should find favor with superintendents and as it is the creation, so to speak, of the Scotch Lunacy Commissioners and their success with it has been so great, it is not at all remarkable that they should see it in the most favorable light. It is probable, moreover, that, as already remarked, the system is at its best in Scotland. That it is not so faultless in other countries is shown by an article in the January number of the *Journal of Mental Science* by DR. JOHN SIBBALD, one of the Scotch Commissioners in Lunacy, on "The Lunacy Administration in Berlin and Scotland with Special Reference to the Care of the Insane in Private Dwellings." This article is as yet incompletely published, and it would therefore be unfair to assume what are DR. SIBBALD's conclusions, but he found that in eight years, out of an average number of apparently not over four hundred insane thus cared for, there had been three suicides, two accidental deaths and four cases of pregnancy,—the minor accidents, except one case of loss of an eye—not being reported. This would be a formidable record for an asylum of that size and is not a recommendation for any system.

One objection to the system, that is not mentioned by DR. RIGGS or others, but which seems a very important one, is that of the influence of the presence of the insane in families and communities. There is a certain contagion in insanity, not necessarily a microbic one, but rather a mental infection that has often a very extensive and serious influence. In an established community like Gheel, or one or two

Scotch villages where the residents are, we may say, acclimated and have become hereditary attendants to the insane this danger is perhaps at a minimum, but the scattering of the chronic insane throughout a farming section, for example, with the freedom and daily contact with individuals of all ages, susceptibilities and predispositions, has a very objectionable aspect in this special regard. There is a certain element of risk in it, not only to the intellects but also to the morals of those who from age or otherwise are in any way impressionable in these respects, and even the best selection of subjects can not altogether guard against this danger. It may not be a very apparent objection to the system, but it is a real one that ought not to be left altogether unconsidered.

Thus far the boarding out plan has been experimented with only to a very slight extent in this country, and in only one State, Massachusetts. It is, however, one of the plans frequently and ardently advocated, and will probably before long come to the fore in some form or other, in many other sections. It falls in with the sentimental tendency to demanding all possible freedom and lack of restraint for the insane, which seems to be growing rather than decreasing, but which has its bad as well as its good side, and should be tempered by good judgment with careful appreciation of all the actual conditions. It is safe to say that if adopted anywhere, it should only be considered as an experiment and an enforced alternative; not as really an improvement over other methods of public care. We certainly can not, in the existing state of affairs in many portions of the country, immediately expect any such success as has been attained in Scotland, where the best we can say is that the disadvantages are reduced probably to a minimum. Well managed county almshouses, such as are found in different parts of the country,—the so-called county asylums of Wisconsin, for example, with all their disadvantages, and they are often very serious ones, are, on the whole, probably a better method of caring for the overflow of the insane from the asylums in this country than would be the plan here discussed. At least this will be true until we can have systems of State care for all the insane, with supervision as competent and thorough and independent of political changes and control as that of Scotland.

"PRINT THE FORMULA ON THE LABEL."

The *New York Ledger* has had the name of being a safe family newspaper, and not a few medical men throughout the country have been among its regular patrons. In view of this fact it should be noted that that paper has, in its editorial columns, come out boldly in the defense of quack remedies, and has already opened its columns to the manufacturers of sarsaparillas, etc. The editor takes for his text the fact that that grand old State, Alabama, has before its Legislature a bill that requires that no patent or proprietary medicine shall be sold unless the formula of the compound shall be printed on the label of the package containing the article.

The editor finds cause for blame against the conservative and preservative legislators of Alabama on the score that such bills are the outcome of the trades-unionism and selfishness of the medical profession. He alleges, while he can not prove, that the free use of quack medicines make a saving in the doctors' bills; giving little heed to the well-known fact that much of the money spent for patent compounds is money spent in the behalf of a speedier call for the physician or the undertaker than if the compounds were left alone. The editor unadvisedly maintains that quack remedies do enable our fellow-citizens to dispense with the services of the regular practitioner, and that this is the real incentive to legislation of that restrictive character that has been found most salutary in certain foreign communities.

The fact remains that the course taken by our Alabama fraternity is probably the one that cuts most deeply into the patent medicine business; therefore, let us urge on every suitable occasion that the manufacturers of these more or less dangerous articles be forced to *print the formula on the label.*

The following are two of the closing paragraphs in the *Ledger* editorial named above, going to show, first, that the quack medicine is convenient and therefore worthy of financial recompense; and second, that a little knowledge of medicine is not a dangerous thing. Nothing in the way of refutation of these arguments needs to be adduced before the readers of this JOURNAL, but we believe it to be well for our readers to know a little of the kinds of defenses that are being constructed for dangerous quack preparations:

"The firm that put on the market the gimlet-pointed screw and amassed a fortune by the means of it had, by reason of the low price and convenient shape in which this article was furnished, a claim on the public for suitable recompense for their efforts. Just so the individual who prepares and offers for sale in convenient form some simple medicine has every right to the monetary return that an excellent article is sure to bring.

"It is the sheerest nonsense to suppose that medical men can form a close corporation and absolutely control the dispensing of medicines. The world is full of people who have most excellent sense about the use of remedies, and are quite as capable of prescribing them as the ordinary doctor. Of course, this cuts into the business of the physician in a very emphatic fashion, and this fact, and not the affectionate solicitude of legislators, is the motive that underlies the introduction of bills of the sort described."

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TELEPHONE RATES' BILL IN THE NEW YORK LEGISLATURE.

The physicians of New York, to whom the use of the telephone has grown to the height of a necessity, have exhibited unwonted interest in this year's campaign against existing extortionate rates. The bill against the companies, as originally introduced, fixed the rates at $78 and $66 respectively. These rates have since been increased to $125 and $85 respectively. Moreover, a six months' continuance of the old high rates is permitted, and the companies can not be bound to follow the new schedule if they can show that they are not remunerative.

The companies are very powerful at Albany and have been able, year after year, to thwart the efforts of physicians and others to lower the tariff. Medical men in other States, besides New York, will be interested to follow the progress of this fight with this grasping monopoly.

THE QUACKS ARE NOT SUPPRESSED.

It is quite as well to know that the advertising quack flourishes just as luxuriantly as of yore, notwithstanding boasts that are being made. He has never been entirely suppressed in our large cities, and at this time the daily newspapers give abundant evidence of the fact. Moreover, we are credibly informed that itinerants are still making periodical trips, and that even in the State where the anti-itinerant movement was so successfully carried out by the late DR. RAUCH they are still active. Boards of Health, in pursuit of other attractions, sometimes grow somnolent.

THE JOURNAL TRAIN.

The itinerary of the JOURNAL train from Chicago to Baltimore has been issued. The Pennsylvania Railroad has done its utmost to provide the very best service known to modern travel, and all the world knows that when the Pennsylvania Railroad tries to do anything, that it is always done well. Our members from the Pacific coast, the interior valley and the great Northwest will meet many of their brethren and travel in luxurious fashion, by taking the JOURNAL SPECIAL THROUGH PULLMAN VESTIBULED TRAIN, from Chicago to Baltimore, Sunday, May 5, at 3:15 P.M. For space, address H. R. DERING, Ass't Gen'l Pass'r Ag't, 248 S. Clark Street, Chicago, or TRUAX, GREENE & Co., 75–77 Wabash Avenue, Chicago. The rates of fare will be one and one-third, making $23.20 for the round trip and $5 for sleeping car each way.

The JOURNAL train may be joined at the principal points between Chicago and Pittsburg, by notifying MR. DERING in advance, by letter or telegram.

THE EXHIBITS AT THE MEETING.

As will be seen by the illustrations, the intending exhibitors will have finer accommodations than at any previous meeting, and the arrangements for the exhibition of their wares leave but little to be desired. The Cyclorama Building has its main entrance directly opposite that of the Academy of Music, and every attending member will have little excuse and no reason for non-attendance on the large exhibit hall, where in these latter days, it has come to resemble a great fair where everything relating to medical pharmacy, optics, instruments, educational appliances, medical literature, sanitary goods and dietetic articles are shown by practiced hands. A good deal may be learned at the Hall of Exhibits, and the wise member will use his opportunity to good advantage, who devotes a reasonable proportion of his time to this feature of the annual gathering.

THE FAULT OF THE CONTRACTOR.

We regret extremely the delay that has occurred in the mailing of the JOURNAL to our readers for the past two weeks.

When we leased the premises No. 86 Fifth Avenue, it was included in the contract that power to run our machinery should be furnished by the lessors, MESSRS. HARRISON BROTHERS, then the owners of the *Times*. When they sold the *Times* property to MESSRS. KRAUS and HAWLEY, they transferred the lease to that firm.

In a few weeks that firm ceased to exist; the *Times* newspaper gave up the ghost and was merged into the *Times-Herald*, the *Times* composing room and property being transferred to the *Herald* Building. Since that transfer the difficulties of managing the JOURNAL have been manifold, and by the breaking of a shaft, for three days last week our presses and other machinery were silent, and only by the hardest labor on the part of our employees were we able to issue the JOURNAL at all, and as this week commenced with another failure and breakdown of the power, we felt obliged to put the case before our readers so that the real cause of the delay in the issue of the JOURNAL may be placed on the shoulders where it belongs. We are, however, promised by the lessors, that every precaution to prevent accidents to the machinery will hereafter be taken.

The JOURNAL will be from time to time subject to such unavoidable annoyance until the ASSOCIATION owns its own building.

CORRESPONDENCE.

Retinal Images in Oblique Astigmatism.

CHICAGO, March 24, 1895.

To the Editor:—Dr. Savage's letter in the issue of March 16 reminds me very much of the comment on a book of which the reviewer has read only the title page and imagined the rest. Indeed, Dr. Savage would be a mind reader of extraordinary ability if he could have guessed correctly the full extent of my remarks before the Chicago Ophthalmological Society from the simple sentence of the report, "he proved

by demonstrations that oblique astigmatism does not cause obliquity of the retinal images." Since Dr. Savage did not know anything about my arguments it is not surprising that his criticism is so little to the point and consists simply in "threshing over old straw."

The object of my remarks was to demonstrate the fallacy of the proposition that in oblique astigmatism the retinal images of horizontal or vertical objects are not themselves horizontal or vertical; or in other words, as Dr. Savage formulated it in his paper on the harmonious symmetrical action of the oblique muscles, that the image of a horizontal arrow can not be in the horizontal meridian of the retina, but is made slanting by the prismatic action of the astigmatic cornea." This obliquity by a prismatic action of the astigmatic cornea was *assumed* also (but not *demonstrated* as Dr. Savage erroneously stated) by Dr. Lippincott to explain certain phenomena of distortion of images in astigmatic eyes. Now I have shown and I believe convinced by my demonstrations all the members present at that meeting, that the image of a horizontal (or vertical) line thrown upon a screen through a sphero-cylinder lens equivalent to an astigmatic cornea does not suffer any such prismatic deflection. As a full account of my arguments will appear in the April number of the *Annals of Ophthalmology and Otology* it is not necessary to argue this point here any further. It is sufficient to repeat what I have already once stated, viz., that inasmuch as Dr. Savage was not conversant with the nature of my arguments, he could not intelligently and successfully attack them.

In conclusion, I wish to call attention to the fact that in this letter Dr. Savage has used the words *obliquity* and *distortion* of the retinal images as if they were interchangeable terms. But they are not synonymous; they apply to radically different conditions; for the retinal image may well be distorted without necessarily being oblique. The image of a luminous point, for instance, is distorted by an astigmatic cornea into an oblong figure, because the rays passing through the astigmatic meridian are not brought to a focus in the retina. The elongation, therefore, always corresponds with the direction of the astigmatic meridian; if the latter is horizontal (or vertical) the oblong image will be horizontal (or vertical) and if the meridian is oblique the elongation will be in an oblique direction; but it is evident that this obliquity of the image is caused by imperfect focalization and must not be confounded with the obliquity caused by the prismatic deflection *assumed* by Drs. Savage, Lippincott and others. While I deny the existence of the latter *obliquity*, I am the last person to deny the *distortion* of the retinal images; for I regard the distortion of the image of a light point as the most valuable sign for detecting astigmatism, and have for many years made the best practical use of it in my astigmometer.

F. C. HOTZ, M.D.

A Simple and Effective Method of Treatment in Purulent Conjunctivitis of Infants.

INDIANAPOLIS, IND., March 25, 1895.

To the Editor:—Twenty-five years of eye-practice, private, and in hospital, has given me abundant opportunity to test the relative merits of the different methods of treatment in suppurative conjunctivitis of infants.

Until about one year ago it was my belief that nitrate of silver, when properly applied, was the most reliable of all medicines in this dangerous disease. In my hands, as well as in those of my professional brethren with whom I am intimately acquainted, it has never failed to cure, if begun before ulceration of the cornea has taken place.

To *properly apply it* does not mean to drop it into the eye, one or more times daily, as it would by such a method be too irritating, if used of sufficient strength to control the suppurative process. It must be applied with a camel's hair pencil to the thoroughly everted palpebral and reflected portion of the conjunctiva, and then washed off, without suffering it to come in contact with the cornea, as strong as 10 to 40 grains to the ounce of water, according to the gravity of the case, or the profuseness of the discharge.

How many physicians are there who can properly evert the lids of a newly born infant? This question can only be answered by those who have tried it. To carry out this method of treatment until the case is cured, it is necessary that the physician make the application himself, once in every twenty-four hours. It dare not be given over to a nurse or parent, and it has to be kept up from two to six weeks.

Let us compare the above difficult but almost certain method to a more simple and easily practiced one, which was introduced by Dr. X. C. Scott, of Cleveland, who presented it to the AMERICAN MEDICAL ASSOCIATION at its last annual meeting. It is as follows:

Hydrastia sulph.		
Acid boric	āā	grs. v.
Sodii bi-borat		
Tinct. opii deod.	. . . . .	℥ss.
Aquæ dest.	. . . . .	℥j.
Mix and filter.		

Dr. Scott has the eye cleansed every twenty minutes and cold compresses applied when required. He then has the above solution injected into the upper and lower conjunctival sacs, about six times a day, by means of a medicine dropper with a nozzle long, smooth, and strong enough to be easily introduced beneath the upper lid without breaking. Once a day he used, in addition to this, a 1 per cent. solution of silver nitrate to the inner surface of the lids. (He *tells me that he does not use the silver now.*)

It will be seen by those who have read the discussion which followed his paper, that nearly all of the gentlemen present gave all of the credit to the silver treatment. They seemed to ignore the fact that the cases got well in about one-fifth of the time usual to the silver treatment alone. It was my fortune to hear from Dr. Scott's own lips all about this method several months before he read the paper to the society. I tried it on a case a few days afterward. It was a very severe one occurring in both eyes, one of which had ulceration of the cornea. I gave a very grave prognosis. A 20 grain solution of silver was applied to the everted conjunctivæ and the yellow root solution was given to the nurse, to be dropped into the eyes every hour afterward. On visiting the hospital the next day I was surprised to find that the discharge of pus had nearly ceased. I therefore simply had the yellow collyrium used every hour, for a few days, and in ten days the child was cured, except the ulcer, which at this date is well and only a small opacity remains.

I have treated several very bad cases since then; all of them were cured inside of two weeks. All that seems to be necessary is to inject it under the lids every hour, cleanse the eyes still more often with tepid water, and use every night a little vaselin on the edges of the lids. They should be watched by the physician to see that nothing goes wrong, and he should be sure to see that ulceration of the cornea did not exist before the treatment was begun.

A greater boon never was given to the busy physician than this one of Dr. Scott. It will save many a child from blindness.

J. L. THOMPSON, M.D.

The Forty-sixth Annual Session of the AMERICAN MEDICAL ASSOCIATION will be held in Baltimore, Md., on Tuesday, Wednesday, Thursday and Friday, May 7, 8, 9 and 10, commencing on Tuesday, at 10 A.M.

A Wise and Able Governor.

LITTLE ROCK, ARK., March 23, 1895.

To the Editor:—I inclose herewith a cutting from the Little Rock *Daily Gazette* of this date. Up to two years ago a law had been in operation in this State, regulating the practice of medicine. It provided for a medical board in each county (about seventy-five of them) consisting of three "physicians," who were appointed by the county judges. They gave certificates of qualification to any and everybody who applied for them, and these "certificates," when once obtained, were good forever, and permitted the holder to practice medicine anywhere in the State. Two years ago this law was repealed and an Act was passed which required that all persons beginning practice after that date should be graduates of some reputable medical college, having not less than two full courses of lectures as a minimum requirement for graduation.

It was a bill repealing this Act and reëstablishing the old county boards (with slight modifications) that the Governor vetoed and which the House of Representatives promptly passed over his veto.[1]

It is so unusual for an executive of a State, or any one else high in authority, to take such lofty grounds in favor of advanced medical education, that I believe it to be the duty of every intelligent physician to uphold and defend Governor Clark, and I thus pointedly call your attention to the matter, that you may give it such editorial notice as it merits. Very respectfully,

J. A. DIBRELL JR.

Pure Air for Cities.

MILTON, KY., March 23, 1895.

To the Editor:—I believe it is entirely practicable to supply cities with air from an altitude of five hundred to a thousand feet, by means of an upright conical cylinder, a force-and-suction air pump, and pipes leading to sleeping and other apartments in the city.

Will you kindly express your opinion upon this subject, and whether it would be of interest to our ASSOCIATION to have the plans and specifications published in our JOURNAL?

Respectfully, S. E. HAMPTON, M.A.M.

ANSWER:—The scheme is practicable. Let us have the plans.

NECROLOGY.

DARWIN G. EATON, M.D., of Brooklyn, died March 17, in his seventy-third year. He was for many years the Professor of Chemistry in the Long Island College Hospital, for which services recognition was given in 1864, by an honorary degree in medicine in that school. He was for a time President of another Brooklyn institution, the well-known Packer Institute, and his standing among men of learning and educators was in the foremost rank. Many hundreds of physicians received their drill in chemistry at his hands. He was a man greatly respected by his pupils.

CHARLES L. HOGEBOOM, M.D., of Brooklyn, died March 12, aged 68 years. He was formerly and until a few years ago a resident of Lawrence, Long Island. He was a Hollander by descent and educated in New York City; the College of Physicians and Surgeons gave him his degree in 1851. He was well versed in surgery, and stronger yet in public medicine, but his great forte in recent years had been that branch of sculpture that finds expression in the bas-relief. His portraitures in plaster, clay and bronze of Irving, Bryant, Jefferson, Franklin and of certain living people of eminence, as well as bas-reliefs of imaginative creations, were a labor of love. The following is a portion of an affectionate tribute to his worth that was penned by one of the editors of the Brooklyn *Eagle:*

"Dr. Hogeboom did not represent the proverb of 'effective in much, but eminent in nothing.' Effective in much he was, eminent in medicine, surgery, sculpture and engraving and in scientific authorship he also was. The worlds of art, of learning and of literature were more familiar to him and he was more at home in them than could be said of the world of affairs. His outlook on politics, parties and contests for political power was ingenuous to childlikeness, but was marked by candor, purity and faith. He will long be remembered and profoundly regretted by a large circle of professional and personal friends."

GUSTAV WEBER BRATENAHL, M.D., of New York City, died March 18, at the early age of 28 years. He was a native of Cleveland, Ohio, a graduate at the College of Physicians and Surgeons, and an ex-interne of the Nursery and Children's Hospital, New York. He held a similar berth at the Sloane Maternity Hospital and at the Roosevelt. In 1891, he spent a year abroad in the foreign clinics, seeking the best masters and methods in order to fit himself for practice and for teaching. His death is ascribed to tuberculosis.

HENRY C. LICHTENTHALER, M.D., March 19, 1895, at Lock Haven, Pa., of typhoid pneumonia, aged 34 years. Dr. Lichtenthaler was born in Lock Haven in 1860 and was a son of the late Dr. H. A. Lichtenthaler. He graduated at the University of Pennsylvania in 1882 and three years later settled in Larned, Kan., where he practiced his profession until 1890 when he returned to Lock Haven. Dr. Lichtenthaler was Secretary of the Clinton County (Pa.) Medical Society and of the West Branch Medical Association. He was City Physician, Coroner of Clinton County and member of the Lock Haven Board of Health. He was a painstaking, honorable competent physician, respected and loved by his profession and patrons.

ELLA M. ANDERSON, M.D., lost her life March 8, in the *Longfellow* wreck on the Ohio River. She was formerly employed at the Ward's Island Insane Asylum, of New York County, as fifth assistant physician on the female side. She was on duty the 5th of the month, at which time she was given a two weeks leave of absence. She appears to have been in attendance upon an invalid, whose life was also lost in the collision.

STEPHEN WALLACE BOWLES, M.D., of Springfield, Mass. died Feb. 12, 1895, aged 59 years. He was a graduate in medicine of the College of Physicians and Surgeons, New York, of the class of 1859, and a member of his State Medical Society since 1876.

RICHARD BLACKWELL MERSHOM, M.D., of Newark, N. J., died March 22, 1895. He was one of the oldest and best-known of the physicians of his State, and had been in feeble health for several years. He was 83 years old, having been born in Lawrenceville, N. J., Jan. 12, 1812. He was graduated from Princeton College in 1834, and five years later from the Jefferson Medical College of Philadelphia. He removed to Newark in 1850 and took up the practice of medicine, having his office in the building where he died. He leaves four daughters, his wife having died about twenty years ago.

A. B. PITZER, M.D., of Tipton, Ind., March 22.——Ralph Harris, M.D., of Macomb, Ill., March 19, aged 82.——J. J. Martin, M.D., of Pittsburg, March 14.——P. A. Skiff, M.D., of Utica, N. Y., March 13, aged 68.——James Youmans, M.D., of Davenport, Iowa, March 16, aged 69.——S. D. Rodgers, of Oakdale, Tenn., March 14.——W. H. Lanoix, of Quincy, Ill., March 18, aged 51.——C. V. Barclay, M.D., Chattanooga, Tenn., March 21.——A. S. Grigsby, M.D., of Marion, Ark., March 16.——W. N. King, M.D., of Abilene, Kan., March 19, aged 69.——D. B. Allen, M.D., of Warsaw, Ky., March 26, aged 46.——Joseph Love, M.D., of Savanna, Ill., March 24, aged 52.——T. C. V. Barkley, M.D., Chattanooga, Tenn., March 21. The Chattanooga Medical Society held a meeting March 22 and passed appropriate resolutions.——S. T. Brooks, M.D., St. Johnsbury, Vt., March 20, aged 72.

[1] And was also passed by the Senate.

ASSOCIATION NEWS.

Section on Physiology.—Dr. E. H. Woolsey, the President of the Section, requests that those having papers on electricity and its medical applications read them in this Section, if circumstances will permit. At the last meeting interesting papers on electricity were read in this Section, with illustrative demonstrations on animals. It is especially appropriate that the physiologic relations of electricity be discussed here. Several important and interesting papers have been promised for this Section.

Dr. Ephraim Cutter, of New York, will read a paper on Food and Thrombosis; Dr. J. Mount Bleyer, of New York, offers elaborate demonstrations of some novel applications of the kinetograph, to accompany a paper entitled, Researches in Rapid Photography by means of Edison's Kinetograph; and the animated Reproduction by the Kinetoscope; showing also by this method the present and future possibilities of taking and reproducing certain animated physiologic movements of the larynx, heart, intestines, etc., and certain diseases having visible symptoms, etc., with a historical review of fifty years of photography.

Dr. E. H. Woolsey will read a paper on the Physiologic and Pathologic Effects of Electricity, and also some notes on Practical Experience with Electricity.

Dr. Charles Gilbert Chaddock, of St. Louis, will read a paper on the Physiology of Instinct.

Those having papers to present in this Section will kindly forward titles immediately to Dr. C. G. Chaddock, Secretary 2900 Washington Avenue, St. Louis, Mo.

Section on Ophthalmology.—The officers of the Section will be unable to arrange for the reading of any more papers than have already been promised for the meeting at Baltimore. EDWARD JACKSON, Chairman.

Denver, Colo., March 20, 1895.

Proposed Botanical Garden for New York City.—It is proposed to raise $250,000 for a garden in one of the public parks of New York City. It is reported that more than $200,000 have been privately subscribed for that purpose. When the other fifth shall have been raised the aid of the city will be demanded. Bronx River Park has been selected as the preferable place for the garden. Among those who are interested in the undertaking are Seth Low, Cornelius Vanderbilt and Bishop Potter.

PUBLIC HEALTH.

Sanitation and Cholera.—To the improvement of the sanitary conditions in India within the past few years is attributed a reduction in the annual average of deaths from Asiatic cholera from 43,000 to less than 19,000.

A Grewsome Connection.—The prevalence of contagious diseases in the New York City schools has led to comment and investigations. As a result of one of these it has been developed that of 112 school trustees 23, or a little less than 20 per cent., are undertakers. The New York *Times* says: "The fact is suggestive; it would be amusing if it were not so tragical."

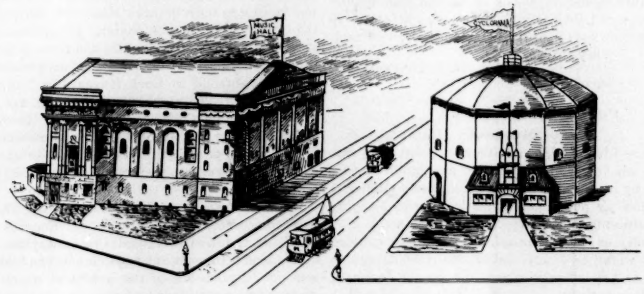
Infectious Stage of Smallpox.—It is understood to be a practical working axiom among medical officers of health, in this country at least, that smallpox is not infectious until the eruption appears. Dr. N. Von Arx, House Physician to the Olten Kantonspital, furnishes to the *Correspondenz-Blatt fuer Schweizer Aerzte* the details of a case in which it would appear that the disease was contracted from a patient during the febrile stage and fully forty-eight hours before the first traces of smallpox rash were discovered. The details are so full as to leave no room for doubt as to the infection of a second patient from the first, and that transmission of the contagion took place before any cutaneous manifestations of smallpox had developed.

To Protect the Public Against Spurious Antitoxin.—A bill has been introduced in the Connecticut Legislature for the protection of the public against inefficient and false diphtheria-antitoxins, some of which have already been offered for sale by unscrupulous dealers. The bill provides that some authoritative guarantee for quality must be supplied for all of the remedy that is put on the market in that State.

Case of Leprosy at New York.—Some considerable notoriety has arisen in connection with the case of the leper C. G., reported in this JOURNAL, on March 16, on account of the discovery by the New York City Board of Health that the case has not been reported, although under observation at intervals for six years. Dr. Ashmead is reported as taking the position that he had not been called in to treat the patient; that he had at no time prescribed for him, and that there was no law requiring him to report the case to the city authorities. He had reported the case to the Supervising

AMERICAN MEDICAL ASSOCIATION

FORTY-SIXTH ANNUAL MEETING.



Music Hall. Museum of Exhibits.

BALTIMORE, MD., MAY 7, 8, 9 AND 10, 1895.

Surgeon-General of the Marine-Hospital Service in the hope that the patient might be provided for in some way so that his family would not suffer harm. In the course of the past six years he had been at intervals an inmate of a tenement house, wherein dwell twenty families, besides his own. He has been a steamship employee, serving as cook, waiter or storekeeper to some of the lines doing business with the South American ports.

Scavengers of the Sea.—Our British confrères continue to be agitated over the "typhoid oyster" and the columns of their lay and professional press are flooded with communications on the subject. The effect has been to injure the oyster trade very seriously and all manner of suggestions are made as to the future regulation of this industry. It is not quite clear, however, that what an Ann Arbor professor calls these "scavengers of the sea" are really responsible *per se* for the manifold ills attributed to them. That an oyster shell may hold typhoid-polluted water is probably true; so also may a glass vessel. Of themselves, oysters have been proved to be destructive of pathogenic bacteria. Mrs. Percy Frankland furnishes a note to *Nature* recalling some of the experiments of her husband, the Professor, as well as those of De Giaxa, on this subject. In the greater bulk of experiments made with oysters and some varieties of mussels replaced in sea water after inoculation through a hole in the shell, which was afterward sealed up, the pathogenic microbes entirely disappeared in six hours; in only two instances were they detected in small numbers at the end of twenty-four hours, and in no case were they identified after forty-eight hours. It is the transplanting of oysters to sewage-contaminated waters or their storage where such contamination ensues, which is responsible for the recent attacks on the good name and fame of these succulent morsels.

Health Reports.—Sanitary reports to the Supervising Surgeon-General of the Marine-Hospital Service:

CHOLERA—FOREIGN.

Austro-Hungary: No cholera cases or deaths. Totals from April 7, 1894 (beginning of epidemic) to Feb. 17, 1895, 15,318 cases, 8,393 deaths.

Russia: Radom Gov't, January 20 to 26, 1 death; Suwalki Gov't, January 20 to 26, 5 cases, 3 deaths; Koono Gov't, January 20 to 21, 1 case, 1 death; Kurland Gov't, January 13 to 26, 6 cases, 2 deaths; Volhynia Gov't, January 13 to 26, 25 cases, 12 deaths; Podolia Gov't, January 20 to February 2, 105 cases, 45 deaths; Taurien Gov't, January 13 to 26, 1 death; Kursk Gov't, January 13 to 19, 1 case.

Turkey: Constantinople, February 11 to 19, 75 cases, 38 deaths; Adalia, February 4 to 18, 17 cases, 11 deaths.

India: Calcutta, February 2 to 9, 34 cases; Madras, February 9 to 15, 4 cases.

YELLOW FEVER—FOREIGN.

Cuba: Havana, March 7 to 14, 3 cases.

SMALLPOX—UNITED STATES.

Connecticut: New Haven, March 16, 1 case varioloid.

Louisiana: New Orleans, March 9 to 21, 3 cases.

Michigan: March 9 to 16, smallpox reported at Detroit, Grand Rapids, Highland Park, Three Rivers and Ypsilanti.

New York: Brooklyn, March 16 to 23, 1 case.

Ohio: Cincinnati, March 15 to 22, 11 cases, 2 deaths.

Pennsylvania: Philadelphia, March 9 to 16, 8 cases, 2 deaths.

Texas: Fort Worth, March 9 to 16, 4 cases.

Wisconsin: Sparta, March 9 to 16, 5 cases (in county jail); Milwaukee, March 9 to 16, 2 cases, 1 death.

Virginia: Portsmouth, March 13, 1 case varioloid (at Naval Hospital).

SMALLPOX—FOREIGN.

Cuba: Havana, March 7 to 14, 2 deaths.

Ecuador: Guayaquil, February 21 to March 8, 3 deaths.

England: Leeds, March 2 to 9, 2 cases; Liverpool, March 2 to 9, 2 cases; Derby, March 2 to 9, 1 death.

Egypt: Alexandria, February 5 to 18, 4 deaths; Cairo, February 5 to 18, 2 deaths.

Gibraltar, February 25 to March 3, 1 case.

Holland: Rotterdam, March 2 to 9, 10 cases, 3 deaths.

India: Calcutta, February 2 to 9, 60 deaths.

Ireland: Dublin, February 23 to March 2, 4 deaths.

Italy: Bologna, March 2 to 9, 3 cases; Marsala, February 23 to March 2, 1 death.

Russia: Batoom, February 19 to 26, 2 deaths; Moscow, February 16 to March 2, 2 cases, 2 deaths; Odessa, February 16 to 23, 2 cases; St. Petersburg, February 16 to 23, 6 cases, 2 deaths.

Scotland: Edinburgh, March 2 to 9, 2 deaths; Glasgow, March 2 to 9, 1 death.

Switzerland: Basel, February 16 to March 2, 17 cases.

Uruguay: Montevideo, February 9 to 16, 4 cases.

MISCELLANY.

Montefiore Home for Chronic Invalids.—This charitable retreat of New York City has received gifts amounting to not less than $50,000 toward a fund for the establishment of a country home, chiefly for persons in the early stages of tuberculosis, to be situated in the Adirondacks or at Vineland.

Another "Faith-Cure" Victim.—The 10-year-old granddaughter of the late Congressman Geo. W. Houck, of Ohio, died on the 18th inst. under the care of a Christian scientist and his wife. She was suffering from typhoid fever and received no medical or other attention save that furnished by the "faith cure."

Boston Hospitals Receive Bequests.—The late Moses Kimball' the founder of the Boston Museum, leaves to the New England Hospital for Women and Children the sum of $21,000; $5,000 to the Massachusetts Charitable Eye and Ear Infirmary, and a like sum to the Boston Dispensary, as well as to a number of homes and charitable societies.

An Old Joke in New Guise.—The New York *Herald* is responsible for reviving this hard saying:

"Druggist—What the dickens have you rung me up for at 1 o'clock in the morning?

"The Tattooed Man—Don't git hot, boss. I only want a little morphin for the ossified woman. She's dyin' terrible hard."

Sanitarium for Consumptives.—At Liberty, N. Y., there will soon be built a new rural retreat for consumptives, for which purpose $20,000 has been contributed by Mr. J. Pierpont Morgan. The location has a high reputation for salubrity and attractiveness. Its easy accessibility to a large population, needing a sanitary retreat less remote from the metropolitan district than are the Adirondacks, will tend to build it up even more rapidly than that on the Saranac.

New York Medical Missionary Training Institute.—This school, conducted by Dr. George D. Dowkontt, in East Forty-fifth Street, New York, has been able to purchase a valuable property of twenty acres, formerly the home of the noted car-builder, the late John Stephenson. His house or castle is located at New Rochelle and overlooks the Long Island Sound. The building, 115 by 60 feet, will serve for the housing of seventy students with their teachers. In the near future, if the work prospers as in the past, there will be erected other halls. The price paid was not far from $90,000.

The Bill for Corporal Punishment in Criminal Assault Cases (New York Legislature).—In the New York Senate, the so-called "whipping-post law" has been adopted, almost without dissent, under the urgent advocacy of the Society for the Prevention of Cruelty to Children. There is little doubt that it will quickly pass the Assembly and receive the signature of the Governor. In order to make the bill go through quickly, it was found necessary to omit wife-beating as an offense punishable by the lash. The ground that was taken, in this particular, was that if this crime was included it would make reconciliation between the wife-beater and his wife impossible. The result will doubtless be seen in an

increase of brutality toward wives by drunken husbands, while at the same time the crime of assault on little girls will be repressed.

Another Jubilee Hospital.—The medical profession of Vienna proposes to commemorate the fiftieth year of the reign of the Emperor, Francis Joseph of Austria, by the foundation of a hospital for children with a capacity of 1,000 beds. The Emperor succeeded to the throne in 1848; it is doubtful, therefore, whether this gigantic monument may be realized to mark the fiftieth year of his reign; but there is much enthusiasm for the project and its completion is confidently anticipated.

"Let the Inebriate Smile Again." A Hint from Norway.—A valuable hint comes to us from Norway. The way seems to be opening up for a form of moderate excise legislation that will in the long run be in the best interests of the lovers of alcohol. In Christiania, the capital of that land, no sale of beer or spirits is now permitted from Saturday afternoon to Monday morning, except to permanent guests residing at respectable cafés. This regulation has led to such a great diminution in the consumption of drinkables that the publicans have begun to complain that the liquor trade is no longer profitable. One day's break in the week is enough to show a great many imbibers the advantages of abstinence, even if it be limited in duration.

Necessity of Frequent Visits.—The Supreme Court of California (Todd v. Myers, 40 Cal., 355) in an action brought by a physician for professional services—the defense being that the visits were too frequent and not necessary—rules that "the defendant having admitted the employment of the plaintiff as a physician to treat his wife and children, the plaintiff was the proper judge of the necessity of frequent visits, and in the absence of proof to the contrary, the court will presume that all the professional visits made were deemed necessary and were properly made. It would be a dangerous doctrine for the sick to require a physician to be able to prove the necessity of each visit before he can recover for his services. This is necessarily a matter of judgment and one concerning which no one save the attending physician can decide. It depends not only upon the condition of the patient, but in some degree upon the course of treatment adopted."

An Attempt at Discipline Fails.—In the Kings County Medical Society, N. Y., an attempt was made in March to bring to book a certain member who had been charged with having transcended the by-laws of that society, in the matter and manner of his publications on the opium habit and similar topics. The council of the society consisted of the following officers: Drs. George McNaughton, President; Joseph H. Hart, Vice-President; David Myerle, Secretary; William C. Braislin, Assistant Secretary; Charles N. Cox, Treasurer; O. A. Gordon, Assistant Treasurer; William Browning, Librarian; Joel W. Hyde, George E. Law, W. W. Browning, J. M. Warfield and Glen R. Butler, Censors; W. B. Chase, Frank E. West, Charles Jewett, Z. Taylor Emery and Isaac H. Barber, Trustees, brought in the charges and a recommendation for suspension of one year. The matter was debated and brought to a vote, whereby the council suffered defeat. In order to sustain the charges a two-thirds vote was required; this number was not quite reached. The council lacked two votes. This society at its last anniversary meeting re-enacted its fealty to the Code of the AMERICAN MEDICAL ASSOCIATION, while retaining its delegate relations to the State Medical Society, which has abrogated the AMERICAN and all other codes.

New York Commission in Lunacy.—The Governor of New York has re-nominated, as Commissioner of Lunacy for the State, Dr. Carlos F. MacDonald, formerly the Superintendent of the State Asylum for Insane Criminals at Auburn. The Commission contains two lay members and one physician. These members have been, in the main, working together harmoniously and to the manifest improvement in the lot and condition of the pauper lunatics that have hitherto been at the mercy of the so-called "county care." Dr. MacDonald is, if we mistake not, the originator of the term "State care," and the practical developer of the idea itself. An editorial writer has said of him and his colleagues that "the delicate, important and comprehensive work under their charge has been so well done by them that the thought of undoing it has become incredible, and the demand for its continuance and full completion has become irresistible. Governor Morton has done nothing better than this appointment and he will do nothing better than it." Dr. MacDonald was graduated by Bellevue Hospital Medical College in 1869. He has written comparatively little, but the neurologic journals have contained his views on malingering, traumatic insanity and surgery of the head in epilepsy.

The New York Orthopedic Hospital.—The twenty-seventh annual report of this charity is a well illustrated pamphlet. The Surgeon-in-Charge speaks of new and enlarged quarters that have contributed to an increased volume of charitable treatments. The total of visits were 17,500, comprising patients having almost every deformity to which childhood is heir. Dr. Shaffer regrets that the institution is restricted to children of an age between 4 and 14 years. In other words, the adolescents who apply for relief can not be accommodated. Scarcely a week goes by that he does not have to turn away youths and misses between 14 and 20 years old, whose actual need for hospital treatment is quite as great as in the case of those of lesser age, whom his rules allow him to admit. The expense account for instruments and plant and mechanical labor is very heavy, not less than $9,300; a repayment of $2,800 for braces, etc., leaves yet unpaid one of the most costly branches of Dr. Shaffer's work; salaries alone to machinists are nearly $6,000. The report states that the sum of $4,000 has recently been donated to the Hospital for the erection of a modern operating room, the want of which has been grievously felt a long time.

Factitious Buchu.—The *Medical Age* states that a certain patent Buchu nostrum at one time afforded a business of $3,000,000 a year. The writer states further that he has in his possession the formula of that nostrum, in Helmbold's own handwriting. Its directions are to make a weak infusion of buchu and barberry leaves, sweetened with New Orleans molasses, colored with burnt sugar, and preserved by adding 16 per cent. tincture of cubebs to the mixture. To this was also added a small proportion of essence of peppermint to give the compound "that peculiar characteristic odor and taste of mint which distinguished genuine buchu preparations." The latter idea was derived from the description, in the United States Dispensatory, of buchu leaves, which states that "the odor is strong, diffusive, and somewhat aromatic, their taste bitterish, and analogous to mint." The fact that such a compound as this could be exploited successfully and its sale acquire such enormous proportions shows plainly the power of newspaper advertising. Helmbold had the ability, however, of securing a great deal of gratuitous advertising. His lavish style of living—his coach and four—his establishment at Long Branch—his so-called liberality by which he gave away pictures costing $20 apiece—all of these were used with consummate shrewdness for advertising purposes until the mention of Helmbold's eccentric doings became as much a part of the daily news as the accounts of base ball and yacht races.

Nitrate of Silver in the Treatment of Burns.—In cases of burns in the second degree, von Bardeleben (*La Semaine Medicale*) uses a 1 per cent. solution of nitrate of silver in connection with sub-nitrate of bismuth. After excising the blisters, the denuded surface is washed with a salt solution, 0.06 per cent., then with the nitrate; the surface is next dusted with bismuth and covered with cotton. Each time that the dressing is changed the wounds from which the eschars have separated should be treated anew with the nitrate of silver

This method is preferable to the ordinary dressing of bismuth, for it considerably diminishes the secretion, favors the formation of the eschars and thus facilitates recovery. It must, however, be cautiously employed. Von Bardeleben has observed a fatal case of argyria in a woman with enormous burns which had been treated with nitrate of silver and bismuth. In the course of the treatment the patient was attacked with a grave form of stomatitis which improved somewhat but did not entirely disappear. In nine weeks more, during which time the silver was used as a dressing, there was an acute exacerbation of the stomatitis; the buccal mucous membrane presented patches with bluish reflections; the patient had diarrhea, vertigo and convulsions and succumbed in eight days. At the necropsy, black deposits were found in the *cul-de-sac* of Douglas and in the large intestine, which deposits, as well as those in the mouth, gave the usual reactions for silver.

"Look Your Best."—The *Medical Examiner* gives place to the following paragraph as a short sermon on the dress of physicians. The admonition was originally addressed to a meeting of life insurance men, held at Little Rock, Ark., by Professor Stewart, of the Mutual Life Company. The modern requirements of city life, at least, confirm the statement that the best invites the best:

"In the progress of to-day two conditions are essential to the highest community success, and these are community activity and community dress. As the individual must appear in the garb of good society if he would enter it, so must the city. The universal deference is to clothes, and there is no condition of physical life, save that of man, that does not perennially put on a new garb; and the larger divisions of the family do so with great toil and pain. The birds molt their feathers, the animals shed their hair, and even the snake pulls off his earth-worn skin. Flowers and trees, and even the solemn pine are no exceptions to nature's law of embellishment, but dress in the fashions of their season's change. The behoof to dress your best is set on the surface of all present life; cities or individuals, the wisdom is the same. To look your best is to invite the best, and the best is life's only ultimate, let man deny it as he will."

The Ordeal Poison of Central Africa.—An English missionary stationed in Central Africa, sends home an account of an exciting adventure which he had in securing a large amount of "mwavé" or ordeal poison. He took possession of four packages in defiance of quite a number of natives armed with spears and shields, and conveyed it to his station. The poison, in the form of the bark of a tree, was packed in two flat baskets and two baboon skins, weighing seven to ten pounds each. Of his examination of these parcels he writes as follows: "We opened up the two baboon skins (mwavé bark is generally carried in these) and found a lot of mwavé bark, a little toy mortar, a hippo-tooth pestle for pulverizing the bark, the two drinking cups, and the medicine stick for marking off the line which divides those who have to drink the mwavé from those who have not. There was also a thin strip of cloth, which my boys told me had been taken from a person who died from the effects of the poison. I weighed the bark, and found there were thirty-four pounds—no small quantity, sufficient to kill many people. It is a deadly poison, and kills people within an hour and a half after drinking it. Birds die if they eat the leaves, and insects if they suck the flower. The Angoni pay large prices in cattle or slaves to those who bring them the mwavé. It is said to come from the Blantyre district, but few natives know the tree."

The local references in the latter part of the above paragraph apply to the tribes and country west and south of Lake Nyassa. The term "mwavé," is probably identical with the better known "mboundon," which is another ordeal bark, derived from a tree or trees of the *Strychnos* group. This source may be allied to the scarcely less notable plants from which the South American Indians prepare their woorara poison. Du Chaillu has stated that certain of the tribes of west equatorial Africa use the *root* for the preparation of the mboundon potion, prizing it as an ordeal and for the purposes of divination. Death is often produced by it within five minutes; the blood gushing from the mouth, eyes and nose. Where vomiting is promptly produced the accused person probably recovers and is considered to have been acquitted.

On Malaria as a Waterborne Disease.—The *New Orleans Medical and Surgical Journal*, June, 1892, contained an article by Dr. Richard Waggoner, of Pensacola, that illustrates very plainly the affirmative side of the question, "Is Malaria a Waterborne Disease?" The following is an extract therefrom:

"The writer has resided, during the past five years on the Naval Reservation near Pensacola, Fla., serving as Apothecary at the Pensacola Naval Hospital. The Naval and Army Reservations are situated on the north side of Pensacola Bay, about seven miles southwest of the city of Pensacola, and about one and one-half miles from the Gulf. The Navy Yard, the villages of Warrington and Woolsey lying just without its walls, and the Naval Hospital, three-quarters of a mile west, are situated on the Naval Reservation, and Fort Barrancasis, situated on the Army Reservation, one mile west of the Navy Yard."

"The villages of Warrington and Woolsey are at the present day extremely unhealthful places, being strongly malarious throughout the whole year, and especially so during the summer and autumn. This condition of affairs has existed during the whole period of my residence there, but the older inhabitants all unite in declaring that previous to about the year 1872 the place was considered very healthful, that chills and fever were unknown, and that people from the interior would locate there to recuperate from malarial troubles. After carefully investigating the matter, I have concluded that the water supply of the villages in question is the source of the greater part of the malarial poison, because the only change of a sanitary nature which has occurred to them consists in their water supply, and in this they have made a very decided change. The villages are the offspring of the Navy Yard, upon the location of which potable water was sought and evidently found, consisting of two springs at the foot of the rise alluded to above, which boiled up out of the pure white sand, clear and cool even during the hottest part of the summer. The authorities in the Yard, having at that time no reservoirs for collecting rain water, caused these two springs to be curbed in with brick for their own supply. These springs are still in existence, and are known as the 'Commodore's Springs.' This source supplied most of the drinking water to families residing in the villages, a small portion of them possessing cisterns, but preferring this water in summer on account of its coolness, until about the year 1872. About that time *driven wells* were introduced to them, and these being cheap, quickly put in operation and convenient, it was not long before almost every household had one or more of them in the back yard. The wells are driven, as a rule, only about twelve feet deep, some of them half that depth.

"Another fact: in January, 1886, a Marine Guard, numbering about forty men, arrived at the Pensacola Navy Yard for duty at that station. These men came directly from the North, and were in fine physical condition. During their first year on the station they began to have frank attacks of remittent and intermittent fever; during their second year there was a much larger proportion of them on the sick list, and between July 1 and August 15 of their third year (1888) every man in the Guard had an attack of either intermittent or remittent fever, twenty-five of the forty being in the hospital at one time.

"The annual report to the Surgeon-General for the year 1888, says: 'The health of the Marine Guard grew worse almost steadily during their stay here until in the early part of August, 1888, before the sickly season had reached its height, they broke down completely, and had to be carried away bag and baggage.'

"The water supply of the Navy Yard consists in a brick cistern for each of the officers' quarters, and three large cisterns, with a combined capacity of 500,000 gallons, affording the general supply. The Marines were supposed to get their drinking water from one of the large cisterns, the nearest of which is about 200 yards from the barracks, but

unfortunately for them there was a driven well very near their barracks, from which they derived the greater part of their drinking water. On the other hand, the officers and their families residing in the Yard used cistern water only, and they were entirely exempt from malarial diseases, sickness of any kind among them being little or none. At Fort Barrancas, only a mile from the Navy Yard, the enlisted men, more than double the number of the Marine Guard, used cistern water exclusively, and their health during the period of so much sickness among the Marines was excellent.

"The third fact is as follows: the present Naval Hospital buildings were constructed in 1875, on the foundations of the old hospital destroyed by fire during the civil war. The water supply consisted until the early spring of 1890, of two driven wells, eighteen feet deep. During the whole time this water was used the place was very unhealthful, the attendants having attacks of malarial fever every year, and patients admitted with other diseases would often develop malarial manifestations while at the hospital. During my first year at the hospital I apparently escaped the poison, but during the two succeeding years, 1888 and 1889, I had several attacks of malarial fever, my wife suffered from it even more than I, and our little girl, during her first and second summers, had typical paroxysms of intermittent fever. In the spring of 1890 an old brick cistern, a relic of the old hospital, was repaired and put in use, since which time we have used cistern water only at the hospital for drinking purposes, and there has not been the slightest evidence of malarial trouble of any kind in my family."

A Court's Opinion of Insane Delusions.—Until human nature radically changes, there will probably always be those who will seek some scapegoat for their crimes. At one time it may be one thing, and on another occasion something quite different. This explains much of the talk about irresistible impulse, hypnotism, insane delusions, and the like. In this connection, one of the most interesting of recent legal decisions is that of the Supreme Court of Tennessee in the case of Wilcox v. State, rendered Nov. 12, 1894. This was an appeal from a conviction of murder in the second degree. The defense relied on was the insanity of the defendant at the time of the homicide, it being insisted that the act was the result of an insane delusion upon his part, rather than a general derangement of his entire mental faculties upon matters generally. It was contended that when he did the killing he was suffering from the insane delusion that the deceased had been on too intimate terms with his wife. He had been addicted to the excessive use of morphin and cocain, taking the drugs in doses sufficient to kill twenty men not addicted to their use, at a single dose; and he had carried on this habit for years, and had grown rapidly more and more addicted to their use, and come more and more under their influence. Many witnesses were examined, both experts and non-experts, in regard to his mental condition. It appeared that he was at one time a man of good mental capacity, described by many of the witnesses as an exceptionally bright man, that he was an active business man, had studied and practiced medicine with success, and was regarded universally as a man competent to attend to his business affairs. He was also shown to have been an arbitrary dictatorial man, of strong will power, and from his boyhood of quick, active, irritable temper. It was strongly pressed upon the court that many of his arbitrary and dictatorial acts were evidences, and the result, of his mental unsoundness and the strong hold which the drugs had obtained over his actions, and that the evidence presented a case of insane delusion, on account of which the verdict should not be upheld. But the court holds otherwise. Its answer is that in criminal cases the correct issue is not that of sanity, but of responsibility. The delusions of a sane man do not make him irresponsible. The question is in such cases, is the delusion set up as a defense the delusion of an insane person? Many men of strong minds, continues the court, have delusions. Remarkable instances are given in the works on medical jurisprudence of delusions in men of prominence in all the walks of life. Lord Kenyon had an unreasoning fear of poverty, and so did Lord Stowell, although he was a man of immense fortune, his home being absolutely destitute of the necessities and comforts of life. Lord Erskine would never sit at a table or remain in a company as one of thirteen persons. Lord Eldon, after he had made up his mind and expressed his opinion lucidly and conclusively, was at all times a prey to grave doubts of his correctness. Lord Brougham, upon more than one occasion, was placed in seclusion, his mind being clearly off balance. Judge Breckenridge, of Pennsylvania, is reported to have on a hot day, while holding court at Sunbury, gradually taken off his clothes, until he sat naked on the bench. Judge Baldwin, of the United States Supreme Court, was a hypochondriac. A distinguished New England judge imagined that a dropsical affection under which he labored was a sort of pregnancy. And yet none of these men were insane, because they had reason and sanity enough to conquer and overcome these delusions. A familiar illustration is that of the Mormon elders, who claimed that they had a direct revelation from heaven permitting them to practice and teach polygamy. The world generally regards this as a rank heresy, and the claim to be the evidence of an unreasonable delusion. It has, however, been held that they can not defend on the ground of such delusion, inasmuch as otherwise they are sane, shrewd, active, successful, and unusually practical men in their business and social relations, and they have been held responsible for such delusions. Nor can it be that the jealous suspicions which so many men entertain without any foundation can be magnified into insane delusions, which will exempt them from punishment for crimes originating in such jealousy. In a sense, all unfounded suspicions are delusions, but they do not for that reason excuse crime.

The rule is tersely stated in Archbold's "Criminal Practice and Pleading" as follows: "The insanity must have been of such a kind as entirely to deprive the prisoner of the use of reason, as applied to the act in question, and the knowledge that he was doing wrong in committing it. If, though somewhat deranged, he is able to distinguish right from wrong in his own case, and to know that he was doing wrong in the act which he committed, he is liable to the full punishment of his criminal acts."

Moreover, the court makes the point that the insanity set up as a defense in this case was not hereditary or natural, but voluntary, in the sense of having originated from the use of drugs. While this is an unfortunate and unhappy condition, the law, it says, does not and can not regard it with the same leniency that it does cases of adventitious insanity, not caused by the act of the party himself. Parties who persist in subjecting themselves to the persistent use and habit of taking alcoholic drink or other poisonous compounds and drugs can not expect the same forbearance and immunity from punishment as those bereft of reason by the act of God. Still it is admissible and proper to show the immoderate use of drugs or whisky, not to excuse crime, but to illustrate the mental condition, with a view to fixing the degree of the crime as it depends upon deliberation and cool malicious purpose.

Society Notes.

ILLINOIS STATE MEDICAL SOCIETY.—Members of the Illinois State Medical Society desiring to attend the annual meeting of the AMERICAN MEDICAL ASSOCIATION as delegates, are requested to send their names at once to the Permanent Secretary.

THE seventh annual meeting of the Shelby County Medical Society will be held in Shelbyville, Ind., Monday, April 8, 1895.——The next meeting of the Washington State Medical Society will be held in Seattle, May 21, 22, and 23, 1895.

College Commencements.

THE Western Pennsylvania Medical College, Pittsburg, March 21, sixty-three graduates.——Chattanooga Medical College, (Tenn.) March 14, fifteen graduates.——Ensworth Medical College, St. Joseph, Mo., March 14, fourteen graduates.——Beaumont Hospital Medical College, St. Louis, March 14, seventeen graduates.——Toledo, Ohio, Medical College, March 19, six graduates.——College of Physicians and Surgeons, Kansas City, Kan., March 19, seven graduates.——Ohio Medical University, Columbus, March 19, thirty-six graduates.——Cleveland, Ohio, Medical College March 20, thirty-nine graduates.——Wooster Medical College, Cleve-

land, Ohio, March 20, fourteen graduates.——Kansas City, (Mo.) Medical College, March 26, twenty-eight graduates. ——Iowa College of Physicians and Surgeons, Des Moines, Iowa, eleven were graduated.——Starling Medical College, Ohio, March 21, sixty-four were graduated. Total for the week 287 graduates.

Hospital Notes.

THE EPISCOPAL HOSPITAL of Philadelphia will receive $10,000 under the devise of Mary D. Fox, of that city.——The Utica (N.Y.) Medical Club held its annual meeting March 14. The following officers were elected for the ensuing year: President, M. J. Davies; Vice-President, P. J. Campbell; Secretary and Treasurer, W. R. Marsden; delegate to State Society, W. E. Wetmore; Librarian, P. J. Barrett.——The contract for building the new hospital at Brockton, Mass., has been awarded. The cost of the structure is not to exceed $1,450. ——The Muhlenberg Hospital, located at Plainfield, N. J., will under the testament of the late William R. Clarkson receive a sum of money, between $2,000 and $3,000.

A HOSPITAL STAFF BROKEN UP.—The New York *Herald* informs us that an important hospital in New Jersey has lost its medical corps by resignation:

"The whole surgical and medical staff of the Alexian Brothers Catholic Hospital of Elizabeth, N. J., with the exception of Dr. E. R. O'Reily, has resigned. They are Drs. Victor Mravlag, chief; Green, Pettit, Grier, Mack and Wilson. The Alexian Brothers recently called for the resignations of Drs. Mravlag, Green, Grier and Wilson. Dr. Mravlag was away from the city at the time. When he returned a meeting of the staff was held with the above result. A letter was sent with the resignations, saying that no complaint had been made to the staff about their service, either individually or collectively, and complaining of the management of the hospital."

St. Louis Notes.

ST. LOUIS MEDICAL SOCIETY.—The meeting on the 23d inst. was given entirely to the trial of a member on "ethical" grounds. By a vote of 75 to 17, a motion to ask for the resignation of Dr. Heine Marks was carried. Dr. Marks refused to tender his resignation, which led to a motion for his expulsion; however, the constitution of the society was found to be silent on this point, and the most that could be done was to suspend Dr. Marks for one year. This was the end of a matter that has agitated the society for some time. Dr. Marks, as Superintendent of the City Hospital, has been freely advertised in the daily press, much to the disgust of the majority of the profession, and all efforts to prevent this infraction of the Code have been unavailing. Now, seemingly, the offender will be more prominently before the public eye than ever. The meeting of the society adjourned after the passage of a resolution to exclude all newspaper reporters from the meetings of the society.

DR. J. M. MATHEWS, of Louisville, was the recipient of many attentions on the occasion of his visit here last week. His address on "Prize Winners," delivered at the Commencement of the Marion-Sims College was filled with wit, wisdom and pathos clothed in eloquence worthy of one of Kentucky's sons. At the college banquets, and at a dinner given Dr. Mathews at the Planter's Hotel, he gave further evidence of his fine abilities as a post-prandial orator, and of his broad sympathies. Arrangements for the meeting here of the Tri-State Medical Society in April are well under way.

SEBUM TREATMENT for tuberculosis is proving itself so well that a special sanitarium for its application is to be opened.

MORTUARY RECORD.—For the week ending March 23, the weekly mortuary record shows 168 deaths compared to 191 last week and 165 the corresponding week last year. The death rate was 16.2 to the 1,000, the estimated population being 540,000. Deaths due to zymotic diseases were 29; constitutional 34; local, 82; developmental, 15; violence, 8. Fourteen cases of smallpox, and 6 deaths were reported. Deaths due to measles were 2; scarlatina 1; diphtheria 8; membranous croup, 2; whooping-cough 1; consumption 20; pneumonia 22; bronchitis, 11; la grippe 4. Forty people under 1 year died; 69 under 5 years; 27, 60 years old or more; 40 in public institutions, and 16 inquests were held. There were 230 births reported.

SMALLPOX AT HOT SPRINGS.—Dr. R. G. Jennings, Secretary of the State Board of Health, reports that at Hot Springs the total number of smallpox and varioloid cases admitted to date (March 23, 1895) is 59; total deaths at hospital to date, 18; total number of cases of smallpox and varioloid in city to date, 25; total number of deaths in city to date, 9. At the present date there are in the hospital 37 cases of smallpox and varioloid and 25 cases in the city. Seventeen houses are now under strict quarantine as a precautionary measure to citizens and visitors. During the last week but three cases of varioloid have been reported, the situation is improving every day, and a decidedly brighter and more cheerful feeling prevails throughout the city.

Louisville Notes.

UNIVERSITY OF LOUISVILLE.—The annual Commencement of the Medical Department of the University of Louisville was held at Macauley's Theater March 18. The valedictory address was delivered by Shirley C. Gage of Texas, the faculty valedictory address by Dr. H. A. Cattell. There were fifty graduates.

YANDELL.—At the Commencement of the University of Louisville, the President, Judge Pirtle of the Board of Trustees, conferred the degree of Doctor of Laws upon Dr. D. W. Yandell, as follows: "The Board of Trustees of this institution on the 16th inst., conferred upon the senior in years, Professor of the Medical Department, Dr. David Wendell Yandell, the eminent and honorable degree of Doctor of Laws, in recognition of his great learning, his transcendent talents, and his distinguished rank in the medical profession. Dr. Yandell has been a Professor in the University of Louisville for more than thirty years, and Professor of Surgery for over twenty-five years. He was a Medical Director in the Confederate Army. He has been President of the AMERICAN MEDICAL ASSOCIATION and the American Association of Surgeons. He is a life member of the College of Physicians and Surgeons of London. A son of the University, his honors are here. By his life work he has greatly contributed to the fame of the University, whose diploma is a passport through the whole medical world. Upon the brow of this, our greatest son, the University places the crown of the highest degree within its powers."

LIVE STOCK INSPECTOR.—Health Officer White is making out a set of rules and regulations to govern the Live Stock Inspector, an office recently created by the council. The Inspector is required to report weekly to the Health Officer the condition of the cattle slaughtered, and to make immediate report in case diseased cattle are found in the market.

EPIDEMIC OF CEREBRO-SPINAL MENINGITIS.—The Secretary of the State Board of Health has just received the report of their representative Dr. B. W. Smock who was sent by the Board to Floyd County to investigate the epidemic there. The disease which he found was cerebro-spinal meningitis; it was confined to an area of four miles, in low country between two creeks. Of the twenty-five cases there were twenty deaths. The afflicted people were found to be very poor, living amid the very worst sanitary conditions.

G. A. R. MEDICAL DEPARTMENT.—The Medical Director, Dr. W. P. White, has appointed a chairman from each of the twelve wards of the city. This committee met in the Citizens Committee headquarters on the 20th inst., and organized. Dr. H. E. Tuley is Secretary. They petitioned the Executive Council for $2,000 for the prosecution of the work of the Medical Department, to be used in the equipment of emergency hospital tents, ambulances, stretchers, bearers,

etc. By means of the necessary papers, each physician residing in the different wards is requested to notify their respective chairmen of their willingness to serve during the Encampment, and these chairmen are to make a daily report to the Director during the Encampment, of the workings of their respective ward organizations.

PRISON PHYSICIAN.—Dr. Waller Dade, the present physician to the Frankfort Penitentiary will resign during April, and already there are many candidates for the position to be vacated.

CITY HOSPITAL.—The first honor men from the two winter schools, recently graduated, will begin their term of service in the City Hospital, on April 1 for one year, as resident physicians.

MORTALITY.—Of the eighty-three deaths reported for the past week, twenty-five were due to pneumonia, eight to consumption, five each to organic heart disease, meningitis and old age; there were five stillbirths.

THE PUBLIC SERVICES.

DIPHTHERIA-ANTITOXIN.

The following letter has been sent to all U. S. Marine-Hospital Stations:

TREASURY DEPARTMENT, OFFICE OF THE SUPERVISING SURGEON-GENERAL MARINE-HOSPITAL SERVICE.
WASHINGTON, D.C., March 28, 1895.

Medical Officer in Command,

Sir:—There have been forwarded to you . . . bottles of diphtheria-antitoxin for use in cases of diphtheria occurring among patients of the Service at your station.

Your attention is called to the circular accompanying the diphtheria-antitoxin, which you will observe so far as may be possible in the administration of the remedy. A full and complete clinical report should be made of each case treated, and transmitted to this office.

Respectfully yours,
WALTER WYMAN, Supervising Surgeon-General, M.H.S.

Directions for the Administration of Diphtheria-Antitoxin.

U. S. MARINE-HOSPITAL SERVICE—HYGIENIC LABORATORY.
March 22, 1895.

DIPHTHERIA.

It is impossible to clinically differentiate many cases of diphtheria from other acute inflammations of the upper air passages. Diphtheria does not in all cases produce an exudate. An exudate does not always mean diphtheria. Diphtheria frequently simulates follicular tonsillitis, pharyngitis, acute and sub-acute rhinitis—especially acute follicular tonsillitis. On the other hand inflammations of the upper air passages which are accompanied with an exudate may be caused by other micro-organisms than the *bacillus diphtheriæ*, viz., the pus organisms, (streptococcus pyogenes; the staphylococci pyogenes aureus and albus), the pneumococcus and the bacillus of Friedlander.

In the majority of cases a bacteriologic examination is necessary to determine the character of the disease, requiring from twelve to eighteen hours.

METHOD OF MAKING A CULTURE IN CASE OF SUSPECTED DIPHTHERIA.

The material for making the culture should be taken from the throat before any germicide has been applied locally, or after the expiration of two hours if such local application has been made.

Two test tubes should be provided, one containing a quantity of coagulated blood serum; the other a small cotton swab on a steel wire, —all properly sterilized.

The patient should be placed in as good a light as possible, the tongue depressed sufficiently to bring the pharynx into view. The swab should then be passed into the pharynx and the exudate rubbed gently, a slight rotary motion being given to the swab. If there is no exudate visible, pass the swab well into the pharynx, touching its posterior wall and pillars of the fauces. Without laying the swab down, remove the cotton plug from the tube containing the coagulated blood serum, insert the swab and rub that portion of it which has touched the exudate, or contains the secretions, gently and thoroughly over the surface of the blood serum, making at least three or four strokes. Due care should be taken not to break the surface of the blood serum. Remove the swab and re urn the cotton plug. Without laying the swab down, replace it in its container; here it can be kept for further cultures or direct examination.

The inoculated tube should be placed in a thermostat and be kept at a temperature from 36.5 degrees, to 38 degrees C., from twelve to eighteen hours. At the expiration of this time the colonies will have developed sufficiently for examination. Cover-slip preparations should then be made therefrom, and examined with the microscope.

If the case is one of diphtheria, cultures should be taken every five or six days after the disappearance of the membrane. This is to determine when the *bacillus diphtheriæ* disappears. So long as the *bacillus diphtheriæ* is to be found, the case is liable to impart the disease to others. The bacillus may remain for a long time—even weeks—after the patient has apparently convalesced. The same rule and precautions should be exercised in making the latter cultures as are recommended for the first.

DIPHTHERIA-ANTITOXIN.

The diphtheria-antitoxin herewith furnished is prepared from the blood of the horse. It contains 0.4 per cent. of trikresol, added to it for its preservation, and has been filtered through unglazed porcelain. If kept in a cool place, away from the light, it will maintain its strength unimpaired at least six months. The diphtheria-antitoxin is put up in bottles of two sizes, containing 20 c.c. and 10 c.c. respectively. The 20 c.c. size has an immunizing strength of 1 to 50,000; the 10 c.c. size 1 to 100,000. (An immunizing strength of 1 to 50,000 means that 1 c.c. of antitoxin will protect 50,000 grams of guinea pig against a lethal dose of toxin; and 1 to 100,000 means that 1 c.c. of the antitoxin will protect 100,000 grams of guinea pig against a lethal dose of toxin.)

INDICATIONS FOR ITS USE.

To obtain the best results the diphtheria-antitoxin should be administered in the early stages of the disease—not later than the fourth day, and be given in a full therapeutic dose. The quantity required for an adult is from 20 to 40 c.c of an immunizing strength of 1 to 50,000, or from 10 to 20 c.c. of an immunizing strength of 1 to 100,000; for a child over 4 years, one half the quantity required for an adult; for younger children, a quantity proportionately less. Cases of mixed infection (diphtheria and pus organisms) require larger quantities of diphtheria-antitoxin, and should be administered at shorter intervals.

As a prophylactic, one-half the quantity required in the treatment of diphtheria will usually be sufficient.

INJECTION.

The syringe and needle should be sterilized in boiling water just prior to use. The site for the injection should be selected where the skin is loose. The most suitable is the side just over the costo-chondral articulation, or on the outer side of the thigh. The skin should be thoroughly disinfected by a solution of bichlorid of mercury or some other antiseptic, the puncture being closed by freshly bichloride cotton or iodoform collodion.

A clinical history should be kept of each case, and should embrace the following:

1. The presence or absence of the membrane; if present, its location and extent.
2. The results of the bacteriologic examination.
3. The day of the disease on which treatment was begun.
4. The date of each administration, and the strength and quantity given of the diphtheria-antitoxin.
5. The alterations observed in the membrane, the pulse, the temperature, the respiration and the general condition; time when such alterations occur.
6. The date of tracheotomy or intubation, if required.
7. The date when the bacilli disappear.
8. The date and character of such complications as erythema, joint pains, albuminuria, hematuria, paralysis or pneumonia; also date of post-mortem examination. If a post-mortem is made, special attention should be given to the appearance of the heart and kidneys.

Army Changes. Official list of changes in the stations and duties of officers serving in the Medical Department, U. S. Army, from March 16, 1895, to March 22, 1895.

First Lieut. ALEXANDER S. PORTER, Asst. Surgeon, leave of absence granted, on surgeon's certificate of disability, is extended four months, on surgeon's certificate of disability.

Major PHILIP F. HARVEY, Asst. Surgeon, leave of absence granted for seven days, is extended twenty-one days.

Capt. EUCLID B. FRICK, Asst. Surgeon, will be relieved from duty at Ft. Townsend, Washington, to take effect upon the expiration of his present leave of absence, and will then report for duty at Presidio of San Francisco, Cal., relieving Capt. CHARLES WILLCOX, Asst. Surgeon. Captain WILLCOX, upon being thus relieved, will report for duty at the U. S. Military Academy, West Point, N. Y., relieving First Lieut. FREDERICK P. REYNOLDS, Asst. Surgeon. Lieut. REYNOLDS, on being thus relieved, will report for duty at Ft. Sam Houston, Texas.

Navy Changes. Changes in the Medical Corps of the U. S. Navy for the week ending March 23, 1895.

Medical Director MICHAEL BRADLEY, ordered before retiring board, March 20, 1895.

P. A. Surgeon F. A. HESLER, ordered to the U. S. S. "Philadelphia."

P. A. Surgeon R. P. CRANDALL, detached from the U. S. S. "Philadelphia," ordered home and granted three months' leave of absence.

LETTERS RECEIVED

Alta Pharmacal Co., St. Louis, Mo.; Appleton, D. & Co., New York, N. Y.

Brown, E. J., Minneapolis, Minn.; Bowker, E. M., Boston, Mass.; Bowers, J. E., Duluth, Minn.; Banta, C. F., Eureka, Ill.; Bowers, R. W., Socorro, N. M.; Bennett, R. G., Pittston, Pa.; Bernd, Henry & Co., St. Louis, Mo.; Bell, W. H., Logansport, Ind.

Dunn, G. & Co., St. Paul, Minn.

Edgerly, E., T., Ottumwa, Iowa; Egbert, Seneca, Philadelphia, Pa.; Ettinger, Chas. S., New York, N. Y.

Fronts, D. B., Ridge Spring, S. C.; Fredigke, Chas. C., Chicago, Ill.

Getz, H. L., Marshalltown, Iowa.

Hall, Geo. E., Cleveland, Ohio; Hummel, A. L., Philadelphia, Pa., (2); Henkel, F. W. E., Chicago, Ill.; Hampton, S. E., Milton, Ky.; Herrmann, John & Son, Green Bay, Wis.; Hand, W. R., Kasota, Minn.

Kelly, E., Lebanon, Ky.; Kent, Jas. L., Bertha, Va.; Kinneman, A. S., Cleveland, Ohio; Kuh, E. J., Chicago, Ill.

Linger, O. E., Starbuck, Minn.

Morgenthau, Geo., Chicago, Ill.; McCormick, H. G., Williamsport, Pa.; MacAlister, Alex., London, England; Moyer, H. N., Chicago, Ill.

Nance, Willis D., Berlin, Germany; Noyes Bros. & Cutler, St. Paul, Minn.; Nordhoff, S. A., Washington, D. C.

Owsley, W. T., Glasgow, Ky.; Owens, John E., Chicago, Ill.

Parke, D., Detroit, Mich.; Purdy, C. W., Chicago, Ill.; Papoid, The Co., New York, N. Y.

Rüehenfeldt & Co., St. Louis, Mo.

Seiler, Geo., Alma, Wis.; Smith, E., Burchard, Neb.; Savage, G. C., Nashville, Tenn.; Smart, Chas., Washington, D. C.; Smith, L. C., Austin, Texas; Senn, N., Chicago, Ill.; Smith, A., Minneapolis, Minn.; Smith, C. H., Lebanon, Ind.

Thompson, R. L., Spokane, Wash.; Thorp, D. D., Lansing, Mich.; Todd, John N., Shady Grove, Ky.; Tuley, Henry E., Louisville, Ky.

Wertz, T., Evansville, Ind.; Wilson, N. L., Elizabeth, N. J.; Wiggins, Wm. H. Jr., Chicago Ill.; Warner, W. R. & Co., Philadelphia, Pa.; Wantmann, Emma, New York, N. Y.; Weaver, W. H., Chicago, Ill.; Würdemann, H. V., Milwaukee, Wis.